

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07 Date of first issue: 2009-10-27

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Reference Fuel B

Material : 1097282, 1069683, 1029654, 1030661, 1029655

Product code : 000000000000000000 000000000000000000

Recommended use of the chemical and restrictions on use

Recommended use : Fuel

Restrictions on use : None known.

Manufacturer or supplier's details

Address : Chevron Phillips Chemical Company LP
Specialty Chemicals
9500 Lakeside Blvd.
The Woodlands, TX 77381

Address : CHEVRON PHILLIPS CHEMICALS ASIA PTE. LTD.
C/O DONG WOO CORPORATION
#B-2601, JEONGJAIL-RO,
BUNDANG-GU, SEONGNAMI-SI,
GYEONGGI-DO, 13557
SOUTH KOREA
Telephone no.: +612-9186-1132

Emergency telephone:**Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

Transport:

CHEMTREC 800.424.9300 or 703.527.3887(int'l)

Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090

Mexico CHEMTREC 01-800-681-9531 (24 hours)

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Argentina: +(54)-1159839431

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Austria: VIZ +43 1 406 43 43 (24 hours/day, 7 days/week)

Belgium: 070 245 245 (24 hours/day, 7 days/week)

Bulgaria: +359 2 9154 233

Croatia: +3851 2348 342 (24 hours/day, 7 days/week)

Cyprus: 1401

Czech Republic: Toxicological Information Center +420 224 919 293, +420 224 915 402

Denmark: Danish Poison Center (Giftlinjen): +45 8212 1212

Estonia: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Finland: 0800 147 111 09 471 977 (24 hours/day)



Reference Fuel B

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07 Date of first issue: 2009-10-27

France: ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (24 hours/day, 7 days/week)
 Germany: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
 Greece: (0030) 2107793777 (24 hours/day, 7 days/week)
 Hungary: +36-80-201-199 (24 hours/day, 7 days/week)
 Iceland: 543 2222 (24 hours/day, 7 days/week)
 Ireland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
 Italy: POISON CENTER MILAN – Azienda Ospedaliera Niguarda Ca` Grande Tel. +39 02 66101029; POISON CENTER ROME – Policlinico “Agostino Gemelli”, Servizio di tossicologia clinica Tel. +39 06 3054343; POISON CENTER ROME – Ospedale Pediatrico Bambino Gesù Tel. +39 06 68593726; POISON CENTER ROME – Policlinico “Umberto I” Tel. +39 06 4997 8000; POISON CENTER FOGGIA – Azienda Ospedaliera Universitaria Riuniti Tel. +39 0881 732326; POISON CENTER NAPLES – Azienda Ospedaliera “Antonio Cardarelli” Tel. +39 081 7472870; POISON CENTER FLORENCE – Azienda Ospedaliera universitaria Careggi Tel. +39 055 7947819; POISON CENTER PAVIA – IRCCS Fondazione Salvatore Maugeri Tel. +39 0382 24444; POISON CENTER BERGAMO – Azienda Ospedaliera “Papa Giovanni XXIII” Tel. 800 883 300; POISON CENTER VERONA – Azienda Ospedaliera Universitaria integrata Tel. 800 011 858;
 Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371 67042473. (24 hours.)
 Liechtenstein: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
 Lithuania: +370 (85) 2362052
 Luxembourg: (+352) 8002 5500 (24 hours/day, 7 days/week)
 Malta: +356 2395 2000
 The Netherlands: NVIC: +31 (0)88 755 8000
 Norway: 22 59 13 00 (24 hours/day, 7 days/week)
 Poland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
 Portugal: CIAV phone number: +351 800 250 250
 Romania: +40213183606
 Slovakia: +421 2 5477 4166
 Slovenia: Phone number: 112
 Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20 (24 hours/day, 7 days/week)
 Sweden: 112 – ask for Poisons Information

Organization that prepared the SDS : Product Safety and Toxicology Group
 E-mail address : SDS@CPChem.com
 Website : www.CPChem.com
 Appointees : 회사명: 리이치 24 시코리아(주).
 주소: 서울시 서초구 헌릉로 7,
 외국기업창업지원연구센터
 (IKP) 908-909호

Reference Fuel B

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07 Date of first issue: 2009-10-27

전화: +82-1067838981

2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids	:	Category 2
Skin corrosion/irritation	:	Category 2
Reproductive toxicity	:	Category 2
Specific target organ toxicity - single exposure	:	Category 3 (Central nervous system)
Specific target organ toxicity - repeated exposure	:	Category 2
Aspiration hazard	:	Category 1
Short-term (acute) aquatic hazard	:	Category 1
Long-term (chronic) aquatic hazard	:	Category 1

GHS label elements

Hazard pictograms	:	   
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Signal Word	:	Danger
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Hazard Statements	:	H225 Highly flammable liquid and vapor. H304 May be fatal if swallowed and enters airways. H315 Causes skin irritation. 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. H400 Very toxic to aquatic life. H410 Very toxic to aquatic life with long lasting effects.
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**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

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1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07 Date of first issue: 2009-10-27

Precautionary Statements**Prevention:**

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash the contact area thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P321 Specific treatment (see supplemental first aid instructions on this label).
P331 Do NOT induce vomiting.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391 Collect spillage.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.

Disposal:

P501 Dispose of contents and container according to wastes control act.

SAFETY DATA SHEET



Reference Fuel B

Version 1.3

Revision Date 2026-08-03

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1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
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Other hazards which do not result in classification

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components

Chemical name	Common Name	CAS-No.	Concentration (% w/w)
2,2,4-Trimethylpentane (Isooctane)	2,2,4-trimethylpentane	540-84-1	$\geq 70 - < 75$
Toluene	toluene	108-88-3	$\geq 30 - < 35$

4. FIRST AID MEASURES

- | | |
|---|--|
| General advice | : Move out of dangerous area.
Show this material safety data sheet to the doctor in attendance.
Material may produce a serious, potentially fatal pneumonia if swallowed or vomited. |
| In case of eye contact | : Flush eyes with water as a precaution.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist. |
| In case of skin contact | : If skin irritation persists, call a physician.
If on skin, rinse well with water.
If on clothes, remove clothes. |
| If inhaled | : Consult a physician after significant exposure.
If unconscious, place in recovery position and seek medical advice. |
| If swallowed | : Keep respiratory tract clear.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital. |
| Most important symptoms and effects, both acute and delayed | : No information available.
No information available. |
| Notes to physician | : No information available. |

5. FIRE-FIGHTING MEASURES

Suitable and unsuitable extinguishing media

Suitable extinguishing media : Alcohol-resistant foam

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07 Date of first issue: 2009-10-27

Carbon dioxide (CO₂)
Dry chemical

- Unsuitable extinguishing media : High volume water jet
- Specific hazards during fire fighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Specific extinguishing methods : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
For safety reasons in case of fire, cans should be stored separately in closed containments.
Use a water spray to cool fully closed containers.
- Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Ensure adequate ventilation.
Remove all sources of ignition.
Evacuate personnel to safe areas.
Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
- Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods and materials for containment and cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

7. HANDLING AND STORAGE

- Advice on protection against fire and explosion : Do not spray on a naked flame or any incandescent material.
Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors).



Reference Fuel B

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07 Date of first issue: 2009-10-27

Use only explosion-proof equipment.
Keep away from open flames, hot surfaces and sources of ignition.

Advice on safe handling : Avoid formation of aerosol.
Do not breathe vapors/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Take precautionary measures against static discharges.
Provide sufficient air exchange and/or exhaust in work rooms.
Open drum carefully as content may be under pressure.
Dispose of rinse water in accordance with local and national regulations.

Conditions for safe storage : No smoking.
Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Observe label precautions.
Electrical installations / working materials must comply with the technological safety standards.

Further information on storage stability : No decomposition if stored and applied as directed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
2,2,4-Trimethylpentane (Isooctane)	540-84-1	TWA	300 ppm	ACGIH
Toluene	108-88-3	TWA	50 ppm	KR OEL
Further information: Suspected human reproductive toxicant				
		STEL	150 ppm	KR OEL
Further information: Suspected human reproductive toxicant				
		TWA	50 ppm	KR PEL
		STEL	150 ppm	KR PEL
		TWA	20 ppm	ACGIH

Other ingredients, which are listed in section 3 but not listed in this section, do not have established occupational exposure limit values.



Reference Fuel B

Version 1.3

Revision Date 2026-08-03

Version 1.3	Revision Date: 2026-08-03	SDS Number (Internal): 100000013141	MSDS number: AA00974-0000000611 Date of last issue: 2022-06-07 Date of first issue: 2009-10-27
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Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Toluene	108-88-3	Toluene	In blood	Prior to last shift of work-week	0.02 mg/l	ACGIH BEI
		Toluene	Urine	End of shift (As soon as possible after exposure ceases)	0.03 mg/l	ACGIH BEI
		o-Cresol	Urine	End of shift (As soon as possible after exposure ceases)	0.3 mg/g creatinine	ACGIH BEI

Engineering measures : Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment. Among the following personal protective equipment, the PPEs which require safety certification need to be certified by KOSHA.

Respiratory protection : If ventilation or other engineering controls are not adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure, a supplied-air NIOSH approved respirator may be appropriate. If exposure to harmful levels of airborne material may occur, a NIOSH approved respirator that provides protection may be appropriate, such as:
Air-Purifying Respirator for Organic Vapors
A positive pressure, air-supplying respirator may be appro-

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07 Date of first issue: 2009-10-27

appropriate if there is potential for uncontrolled release, aerosolization, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Eye protection : Eye wash bottle with pure water
Tightly fitting safety goggles

Hand protection

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.

Wear as appropriate:
Flame retardant antistatic protective clothing.
Workers should wear antistatic footwear.

Hygiene measures : When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Color	: Colorless
Odor	: Mild, Hydrocarbon
Odor Threshold	: No data available
pH	: Not applicable
Melting point/freezing point	: No data available
Pour point	: No data available
Boiling point/boiling range	: 99 °C
Flash point	: -12.1 °C

SAFETY DATA SHEET

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

Method: Tag closed cup

Evaporation rate	:	1
Self-ignition	:	No data available
Upper explosion limit / Upper flammability limit	:	Upper flammability limit 6.5 %(V)
Lower explosion limit / Lower flammability limit	:	Lower flammability limit 1 %(V)
Vapor pressure	:	1.5 PSI (37.8 °C)
Solubility(ies) Water solubility	:	negligible
Relative vapor density	:	3.69 (Air = 1.0)
Relative density	:	0.75 (15.6 °C)
Density	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Viscosity Viscosity, kinematic	:	0.5 - 0.7 mm ² /s (20 °C)
Oxidizing properties	:	No
Molecular weight	:	Not applicable

10. STABILITY AND REACTIVITY

Chemical stability and possibility of hazardous reactions	:	Reactivity: Stable under recommended storage conditions. Chemical stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Possibility of hazardous reactions: Hazardous polymerization does not occur. Possibility of hazardous reactions:
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SDS Number:100000013141

10/26

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

Conditions to avoid	:	Vapors may form explosive mixture with air.
Incompatible materials	:	Heat, flames and sparks.
	:	May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous decomposition products	:	Carbon oxides

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : No data available

Health hazard information**Acute toxicity****Product:**

Acute oral toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: > 40 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method

Components:**2,2,4-Trimethylpentane (Isooctane):**

Acute oral toxicity : LD50 (Rat, male and female): > 5,000 mg/kg
Method: OECD Test Guideline 401
Symptoms: Salivation
GLP: yes
Assessment: Not harmful

Acute inhalation toxicity : LC50 (Rat, male and female): > 33.52 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Method: OECD Test Guideline 403
GLP: yes
Assessment: 0 - Not toxic

Acute dermal toxicity : LD50 (Rabbit, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
GLP: yes

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

Assessment: The substance or mixture has no acute dermal toxicity

Toluene:

Acute oral toxicity : LD50 (Rat, Not Specified): 6,500 mg/kg
Assessment: Not harmful

Acute inhalation toxicity : LC50 (Rat): 25.7 - 30 mg/l
Exposure time: 4 h
Test atmosphere: vapor

Acute dermal toxicity : LD50 (Rabbit, Not Specified): 12,400 mg/kg
Assessment: Not harmful

Skin corrosion/irritation**Product:**

Result : Skin irritation
Remarks : largely based on animal evidence

Components:**2,2,4-Trimethylpentane (Isooctane):**

Method : OECD Test Guideline 404
Result : Skin irritation
GLP : yes

Toluene:

Species : Rabbit
Exposure time : 4 h
Method : No information available.
Result : Skin irritation

Serious eye damage/eye irritation**Product:**

Remarks : Vapors may cause irritation to the eyes, respiratory system and the skin.

Components:**2,2,4-Trimethylpentane (Isooctane):**

Result : No eye irritation

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

Method : OECD Test Guideline 405
GLP : yes

Toluene:

Species : Rabbit
Remarks : slight irritation
Not classified due to data which are conclusive although insufficient for classification.

Respiratory or skin sensitization**Skin sensitization**

Did not cause sensitization on laboratory animals.

Product:

Result : No data available

Components:**2,2,4-Trimethylpentane (Isooctane):**

Test Type : Magnussen-Kligman Test
Species : Guinea pig
Method : OECD Test Guideline 406
Result : Did not cause sensitization on laboratory animals.
GLP : yes

Toluene:

Test Type : Buehler Test
Species : Guinea pig
Result : Did not cause sensitization on laboratory animals.

Carcinogenicity**Product:**

Remarks : Not expected to be carcinogenic based on individual component data.

Components:**2,2,4-Trimethylpentane (Isooctane):**

No data available

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

Toluene:

Not applicable

Species : Rat
Application Route : Inhalation
Exposure time : 2 yrs
Dose : 0, 600, 1200 ppm
Frequency of Treatment : 6.5 h/d, 5 d/wk
Remarks : No evidence of carcinogenicity

Species : Mouse
Application Route : Inhalation
Exposure time : 2 yrs
Dose : 0, 600, 1200 ppm
Frequency of Treatment : 6.5 h/d, 5 d/wk
Remarks : No evidence of carcinogenicity

Carcinogenicity - Assessment : Not classifiable as a human carcinogen.

Germ cell mutagenicity**Product:**

Genotoxicity in vitro : Remarks: No data available

Components:**2,2,4-Trimethylpentane (Isooctane):**

Not applicable

Genotoxicity in vitro : Test Type: Ames test
Method: Mutagenicity (Escherichia coli - reverse mutation assay)
Result: negative
GLP: yes

Test Type: Mouse lymphoma assay
Method: OECD Guideline 476
Result: negative
GLP: yes

Test Type: Sister Chromatid Exchange Assay
Result: negative

Test Type: Unscheduled DNA synthesis assay
Result: negative

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

Genotoxicity in vivo : Test Type: Unscheduled DNA synthesis assay
Species: Mouse
Dose: 500 mg/kg
Result: negative

Test Type: Unscheduled DNA synthesis assay
Species: Rat
Dose: 500 mg/kg
Result: negative

Germ cell mutagenicity- Assessment : Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Toluene:

Not applicable

Genotoxicity in vitro : Test Type: Ames test
Result: negative

Test Type: Sister Chromatid Exchange Assay
Result: negative

Test Type: Mouse lymphoma assay
Result: negative

Test Type: Cytogenetic assay
Result: negative

Genotoxicity in vivo : Test Type: Cytogenetic assay
Result: negative

Test Type: Mouse micronucleus assay
Result: negative

Germ cell mutagenicity- Assessment : Animal testing did not show any mutagenic effects.

Reproductive toxicity**Components:****2,2,4-Trimethylpentane (Isooctane):**

No data available

Reproductive toxicity - Assessment : Animal testing did not show any effects on fertility.
Animal testing did not show any effects on fetal development.

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

Toluene:

Suspected of damaging fertility or the unborn child.

According to Ministry of Employment and Labor Public Notice: Category 2

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.
Some evidence of adverse effects on development, based on animal experiments.

STOT-single exposure**Product:**

Target Organs : Central nervous system
Assessment : May cause drowsiness or dizziness.

Components:**2,2,4-Trimethylpentane (Isooctane):**

Assessment : May cause drowsiness or dizziness.

Toluene:

Assessment : May cause drowsiness or dizziness.

STOT-repeated exposure**Product:**

Routes of exposure : Inhalation
Target Organs : Auditory organs
Assessment : May cause damage to organs through prolonged or repeated exposure.

Components:**Toluene:**

Routes of exposure : Inhalation
Target Organs : Auditory organs, color vision
Assessment : May cause damage to organs through prolonged or repeated exposure.

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

Repeated dose toxicity**Components:****2,2,4-Trimethylpentane (Isooctane):**

Species	: Rat, Male and female
NOAEL	: 8.117 mg/l, 2220 ppm
Application Route	: Inhalation
Test atmosphere	: vapor
Exposure time	: 13 weeks
Number of exposures	: 6 hr/day 5 d/wk
Dose	: 0, 668, 2220, 6646 ppm
Method	: OECD Guideline 413
GLP	: yes
Symptoms	: Increased organ weight., Hyaline droplet formation.
Remarks	: Information given is based on data obtained from similar substances.

Toluene:

Species	: Rat
NOAEL	: 625 ppm
Application Route	: Inhalation
Exposure time	: 15 wk
Number of exposures	: 6.5 h/d, 5 d/wk
Dose	: 0, 100, 625, 1250, 3000 ppm

Species	: Mouse
NOAEL	: 100 ppm
Application Route	: Inhalation
Exposure time	: 14 wk
Number of exposures	: 6.5 h/d, 5 d/wk
Dose	: 0, 100, 625, 1250, 3000 ppm

Aspiration toxicity**Product:**

May be fatal if swallowed and enters airways.

Components:**2,2,4-Trimethylpentane (Isooctane):**

May be fatal if swallowed and enters airways.

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

Toluene:

May be fatal if swallowed and enters airways.

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information**Product:**

Remarks : Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
Concentrations substantially above the TLV value may cause narcotic effects.
Solvents may degrease the skin.

12. ECOLOGICAL INFORMATION**Ecotoxicity****Components:****2,2,4-Trimethylpentane (Isooctane):**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0.11 mg/l
Exposure time: 96 h
Test Type: semi-static test
Method: OECD Test Guideline 203
GLP: yes
Remarks: Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.4 mg/l
Exposure time: 48 h
Test Type: static test
Remarks: Information given is based on data obtained from similar substances.

Toxicity to algae/aquatic plants : EL50: 2.943 mg/l
Exposure time: 72 h

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07 Date of first issue: 2009-10-27

Method: QSAR modeled data

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEL (Daphnia magna (Water flea)): 0.17 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211
GLP: yes
Remarks: Information given is based on data obtained from similar substances.

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Toluene:Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 18 - 36 mg/l
Exposure time: 96 hToxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 3.78 mg/l
Exposure time: 48 hToxicity to algae/aquatic plants : EC50 (Chlamydomonas angulosa (Green algae)): 134 mg/l
Exposure time: 72 h**Ecotoxicology Assessment**

Acute aquatic toxicity : Toxic to aquatic life.

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

Persistence and degradability**Product:**

Biodegradability : Remarks: This material is expected to be readily biodegradable., Expected to be inherently biodegradable.

Components:**2,2,4-Trimethylpentane (Isooctane):**Biodegradability : Result: Not readily biodegradable.
Method: OECD Test Guideline 301
GLP: yes
Remarks: Expected to be inherently biodegradable.
Information given is based on data obtained from similar sub-

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

stances.

Toluene:

Biodegradability : Remarks: This material is expected to be readily biodegradable.

Bioaccumulative potential**Components:****2,2,4-Trimethylpentane (Isooctane):**

Bioaccumulation : Bioconcentration factor (BCF): 231
Method: QSAR modeled data
Remarks: This material is not expected to bioaccumulate.

Toluene:

Bioaccumulation : Remarks: This material is not expected to bioaccumulate.

Mobility in soil**Components:****2,2,4-Trimethylpentane (Isooctane):**

Mobility : Medium: Air
Method: Calculation, Mackay Level I Fugacity Model
Remarks: After release, disperses into the air.

Toluene:

Mobility : Remarks: Not expected to adsorb on soil.

Other adverse effects**Product:**

Additional ecological information : Very toxic to aquatic life with long lasting effects.

Components:**2,2,4-Trimethylpentane (Isooctane):**

Results of PBT and vPvB assessment : Non-classified PBT substance
Non-classified vPvB substance

Toluene:

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

Results of PBT and vPvB assessment : Non-classified vPvB substance
Non-classified PBT substance

Endocrine disrupting properties

No data available

13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

Disposal precautions

Dispose of contents and container according to wastes control act.

14. TRANSPORT INFORMATION**International Regulations****IATA-DGR**

UN/ID No. : UN 1268
Proper shipping name : Petroleum products, n.o.s.
Class : 3
Packing group : II
Labels : Class 3 - Flammable Liquid
Packing instruction (cargo aircraft) : 364

IMDG-Code

UN number : UN 1268
Proper shipping name : PETROLEUM PRODUCTS, N.O.S.
()
Class : 3
Packing group : II
Labels : 3
EmS Code : F-E, S-E
Marine pollutant : no

Maritime transport in bulk according to IMO instruments

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

II - Hazardous Properties**Domestic regulation**

Refer to section 15 for specific national regulation.

Special precautions for user

Remarks : UN1268

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

15. REGULATORY INFORMATION**National regulatory information****Regulation under the Occupational Safety and Health Act****Harmful Substances Prohibited from Manufacturing**

Not applicable

Harmful Substances Required Permission for Manufacture

Not applicable

Harmful Agents to be kept below Occupational Exposure Limits

Chemical name	CAS-No.
Toluene	108-88-3

Harmful Agents Required to be kept below Permission Levels

Chemical name	CAS-No.
Toluene	108-88-3

Hazardous substances requiring management

Chemical name	CAS-No.	Threshold limits (%)
Toluene	108-88-3	≥ 1 %

Special Management Materials

Not applicable

Controlled Substances Subject to Environment Monitoring

Chemical name	CAS-No.	Threshold limits (%)
Toluene	108-88-3	≥ 1 %

Controlled Substances Subject to Health Examination

Chemical name	CAS-No.	Threshold limits (%)
Toluene	108-88-3	≥ 1 %

**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

Hazardous Substances Subject to Process Safety Management (PSM) Reporting Obligation

Chemical name/Classification	Manufacturing or handling quantity	Storage quantity
Flammable liquids	5,000 kg	200,000 kg

K-OSHA Hazardous Substances (Occupational Safety and Health Regulations, Table 1)

Category
Flammable liquid

K-OSHA Hazardous Substances (Occupational Safety and Health Regulations, Table 9)

Category	Manufacturing or handling quantity
Flammable liquid	400 liter

Regulation under the Chemicals Control Act**Restricted Chemicals**

Not applicable

Prohibited Chemicals

Not applicable

Toxic Release Inventory

Chemical name	CAS-No.	Group	Threshold limits (%)
Toluene	108-88-3	Group II	≥ 1 %

Accident Precaution Chemicals

Not applicable

Chemicals of Acute and Chronic Hazard to Human Health and the Environment**Substances Acutely hazardous to humans**

Not applicable

Substances Chronically hazardous to humans

Not applicable

Substances Hazardous to the environment

Not applicable

Accident Precaution Chemicals

Not applicable

Toxic Release Inventory

Chemical name	CAS-No.	Group	Threshold limits (%)
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**Reference Fuel B**

Version 1.3

Revision Date 2026-08-03

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1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
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Toluene	108-88-3	Group II	>= 1 %
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Act on Registration and Evaluation of Chemical Substances (K-REACH)**Restricted Chemicals**

Not applicable

Prohibited Chemicals

Not applicable

Substances with Unconfirmed Hazards

Not applicable

Dangerous Substances Safety Management Act

Classification : Group 4, Flammable liquids, Type 1 petroleums, Water insoluble liquid

Hazard rank : Hazardous rank II

Designated Quantity : 200 liter

Safety Warning : Keep away from fire

Waste Control Act

Industrial general wastes

Follow article 13 of the act to dispose the product waste

Other requirements in domestic and other countries**The ingredients of this product are reported in the following inventories:**

EU REACH : This product is in full compliance according to REACH regulation 1907/2006/EC.

CH INV : On the inventory, or in compliance with the inventory

TSCA : On or in compliance with the active portion of the TSCA inventory

DSL : All components of this product are on the Canadian DSL

AU AIC : On the inventory, or in compliance with the inventory

NZIoC : Not in compliance with the inventory

ENCS : On the inventory, or in compliance with the inventory

KECI : A substance(s) in this product was not registered, notified to



Reference Fuel B

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07
			Date of first issue: 2009-10-27

be registered, or exempted from registration by CPChem according to K-REACH regulations.

PICCS	:	On the inventory, or in compliance with the inventory
TW TCSI	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory

16. OTHER INFORMATION

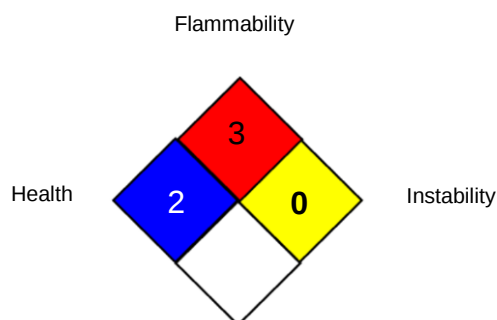
Further information

Issuing date : 2009-10-27

Revision number and date

Number of Revision : 1.3
 Revision Date : 2026-08-03
 Other information : None.
 Date format : yyyy/mm/dd

NFPA:



Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
KR OEL	:	Harmful Agents to be kept below Occupational Exposure Limits
KR PEL	:	Harmful Agents Required to be kept below Permission Levels



Reference Fuel B

Version 1.3

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000611
1.3	2026-08-03	100000013141	Date of last issue: 2022-06-07 Date of first issue: 2009-10-27

ACGIH / TWA : 8-hour, time-weighted average
 KR OEL / TWA : Time Weighted Average
 KR OEL / STEL : Short Term Exposure Limit
 KR PEL / TWA : TWA
 KR PEL / STEL : STEL

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardization; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organization for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MERCOSUR - The Agreement for the Facilitation of the Transport of Dangerous Goods; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECL - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

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

KR / EN