

n-Heptane Primary Reference Fuel (PRF)

Version 1.9

Revision Date 2019-10-13

according to GB/T 16483 and GB/T 17519

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

Product Name : n-Heptane Primary Reference Fuel (PRF)
Material : 1084146, 1021846, 1021847, 1021848, 1021849, 1021850,
1031134

Company : Chevron Phillips Chemical Company LP
Specialty Chemicals
10001 Six Pines Drive
The Woodlands, TX 77380

Local : Chevron Phillips Chemicals (Shanghai) Corporation
Room 1810-1812, Shanghai Mart,
2299 Yan An Road (W),
Shanghai, PRC 200336

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

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

SECTION 2: Hazards identification**Classification of the substance or mixture**

GHS Classification and Labeling: Follow GB 13690, GB 15258 and GB 30000.2 to GB 30000.29 (GHS 2011)

Emergency Overview

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Danger**Form:** Liquid **Physical state:** Liquid **Color:** Clear **Odor:** Sweet

Hazards : Highly flammable liquid and vapor. Causes skin irritation. May cause drowsiness or dizziness. May be fatal if swallowed and enters airways. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Classification

: Flammable liquids, Category 2
 Skin corrosion/irritation, Category 2
 Specific target organ toxicity - single exposure, Category 3,
 Narcotic effects
 Aspiration hazard, Category 1
 Short-term (acute) aquatic hazard, Category 1
 Long-term (chronic) aquatic hazard, Category 1

Labeling**Symbol(s)****Signal Word**

: Danger

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.
 H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statements

: **Prevention:**
 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.
 P261: Avoid breathing dust/fume/gas/mist/vapors/spray.
 P264: Wash skin thoroughly after handling.
 P271: Use only outdoors or in a well-ventilated area.
 P273: Avoid release to the environment.
 P280: Wear protective gloves/ eye protection/ face protection.
Response:
 P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.
 P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
 P304 + P340 + P312: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
 P331: Do NOT induce vomiting.
 P332 + P313: If skin irritation occurs: Get medical advice/

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attention.

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.

P405: Store locked up.

Disposal:

P501: Dispose of contents/ container to an approved waste disposal plant.

SECTION 3: Composition/information on ingredientsSynonyms : Normal Heptane
Dipropilmetano

Molecular formula : C7H16

Chemical name	CAS-No. / EINECS-No.	Concentration [wt%]
n-Heptane	142-82-5	100

SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Symptoms of poisoning may appear several hours later. Do not leave the victim unattended.

If inhaled : Move to fresh air. If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact : If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point : -4 °C (25 °F)

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	Method: Tag closed cup
Autoignition temperature	: 203.85 °C (398.93 °F)
Suitable extinguishing media	: Dry chemical. Carbon dioxide (CO ₂). Alcohol-resistant foam.
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.
Special protective equipment for fire-fighters	: Wear self-contained breathing apparatus for firefighting if necessary.
Further information	: 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.
Fire and explosion protection	: Do not spray on an open flame or any other incandescent material. Use only explosion-proof equipment. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.
Hazardous decomposition products	: Carbon oxides.

SECTION 6: Accidental release measures

Personal precautions	: 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 for 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).

SECTION 7: Handling and storage**Handling**

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
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section 8. Smoking, eating and drinking should be prohibited in the application area. 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.

Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary, but may not by themselves be sufficient. Review all operations, which have the potential to generating and accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106 "Flammable and Combustible Liquids"; National Fire Protection Association (NFPA 77), "Recommended Practice on Static Electricity"; and/or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising Out of Static, Lightning, and stray Currents".

Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Use only explosion-proof equipment. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers : 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.

SECTION 8: Exposure controls/personal protection**Ingredients with workplace control parameters**

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Components	Basis	Value	Control parameters	Note
n-Heptane	GBZ 2.1-2007	PC-TWA	500 mg/m ³	
	GBZ 2.1-2007	PC-STEL	1,000 mg/m ³	

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

Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to

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maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

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

SECTION 9: Physical and chemical properties**Information on basic physical and chemical properties****Appearance**

- Form : Liquid
 Physical state : Liquid
 Color : Clear
 Odor : Sweet

Safety data

- Flash point : -4 °C (25 °F)
 Method: Tag closed cup
- Lower explosion limit : 1 %(V)
- Upper explosion limit : 7 %(V)
- Oxidizing properties : no
- Autoignition temperature : 203.85 °C (398.93 °F)
- Molecular formula : C7H16
- Molecular weight : 100.23 g/mol
- pH : Not applicable

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Pour point	: No data available
Boiling point/boiling range	: 98 °C (208 °F)
Vapor pressure	: 1.60 PSI at 38 °C (100 °F)
Relative density	: 0.69 at 16 °C (61 °F)
Density	: 5.75 L/G at 20 °C (68 °F)
Water solubility	: Negligible
Partition coefficient: n-octanol/water	: No data available
Relative vapor density	: 3.4 (Air = 1.0)
Evaporation rate	: 3.46
Percent volatile	: > 99 %
Conductivity	: < 1 pSm at 20 °C

SECTION 10: Stability and reactivity

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 reactions : Hazardous reactions: Hazardous polymerization does not occur.

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

Hazardous reactions: Vapors may form explosive mixture with air.

Conditions to avoid : Not applicable.

Materials to avoid : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous decomposition products : Carbon oxides

Other data : No decomposition if stored and applied as directed.

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SECTION 11: Toxicological information**Acute oral toxicity**

n-Heptane : LD50: > 5,000 mg/kg
Species: Rat
Method: OECD Test Guideline 401
Information given is based on data obtained from similar substances.

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Skin irritation : Irritating to skin.

May cause skin irritation in susceptible persons.

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

Sensitization

n-Heptane : Did not cause sensitization on laboratory animals.
Information given is based on data obtained from similar substances.

Repeated dose toxicity

n-Heptane : Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 12.47 mg/l
Exposure time: 16 wk
Number of exposures: 12 h/d, 7 d/wk
NOEL: 12.47 mg/l
No adverse effect has been observed in chronic toxicity tests.

Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 12.35 mg/l
Exposure time: 26 wk
Number of exposures: 6 h/d, 5 d/wk
Method: OECD Test Guideline 413
No adverse effect has been observed in chronic toxicity tests.

Genotoxicity in vitro

n-Heptane : Test Type: Ames test
Method: Mutagenicity (Escherichia coli - reverse mutation assay)
Result: negative

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Test Type: Mammalian cell gene mutation assay
 Method: OECD Guideline 476
 Result: negative

Test Type: Chromosome aberration test in vitro
 Method: OECD Guideline 473
 Result: negative

Test Type: Mitotic recombination
 Result: negative

Reproductive toxicity

n-Heptane : Species: Rat
 Sex: male and female
 Application Route: Inhalation
 Dose: 0, 900, 3000, 9000 ppm
 Number of exposures: 6 hr/d, 5 d/wk
 Test period: 13 wk
 Method: OECD Test Guideline 416
 NOAEL Parent: 9000 ppm
 NOAEL F1: 3000 ppm
 NOAEL F2: 3000 ppm
 Information given is based on data obtained from similar substances.

Developmental Toxicity

n-Heptane : Species: Rat
 Application Route: Inhalation
 Dose: 0, 900, 3000, 9000 ppm
 Exposure time: GD6-15
 Number of exposures: 6 hrs/d
 NOAEL Teratogenicity: 9000 ppm
 NOAEL Maternal: 3000 ppm

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Aspiration toxicity : May be fatal if swallowed and enters airways.
 Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

CMR effects

n-Heptane : Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
 Teratogenicity: Animal testing did not show any effects on fetal development.
 Reproductive toxicity: No toxicity to reproduction

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

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SECTION 12: Ecological information**Toxicity to fish**

n-Heptane : LL50: 5.738 mg/l
 Exposure time: 96 h
 Species: Oncorhynchus mykiss (rainbow trout)
 Method: QSAR modeled data

Toxicity to daphnia and other aquatic invertebrates

n-Heptane : EC50: 1.5 mg/l
 Exposure time: 48 h
 Species: Daphnia magna (Water flea)
 static test Toxic to aquatic organisms.

LC50: 0.1 mg/l
 Exposure time: 96 h
 Species: Mysidopsis bahia (mysid shrimp)
 semi-static test Very toxic to aquatic organisms.

Toxicity to algae

n-Heptane : EL50: 4.338 mg/l
 Exposure time: 72 h
 Species: Pseudokirchneriella subcapitata (microalgae)
 Method: QSAR

Toxicity to fish (Chronic toxicity)

n-Heptane : NOELR: 1.284 mg/l
 Exposure time: 28 d
 Species: Oncorhynchus mykiss (rainbow trout)
 Method: QSAR modeled data

Biodegradability

n-Heptane : Result: Readily biodegradable.
 70 %
 Testing period: 10 d

Results of PBT assessment

n-Heptane : Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information

: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Very toxic to aquatic life with long lasting effects.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard

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n-Heptane : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard

n-Heptane : Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product : 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.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

UN1206, HEPTANES, 3, II, MARINE POLLUTANT, (HEPTANE)

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN1206, HEPTANES, 3, II, (-4 °C), MARINE POLLUTANT, (HEPTANE)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN1206, HEPTANES, 3, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))

UN1206, HEPTANES, 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (HEPTANE)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))

UN1206, HEPTANES, 3, II, ENVIRONMENTALLY HAZARDOUS, (HEPTANE)

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ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)

UN1206, HEPTANES, 3, II, ENVIRONMENTALLY HAZARDOUS, (HEPTANE)

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**SECTION 15: Regulatory information**

Classification and Labeling of Commonly Used Dangerous Chemical Substances : Primary label: Combustible Liquid.

Notification status

Europe REACH	:	This product is in full compliance according to REACH regulation 1907/2006/EC.
Switzerland CH INV	:	On the inventory, or in compliance with the inventory
United States of America (USA) TSCA	:	On or in compliance with the active portion of the TSCA inventory
Canada DSL	:	All components of this product are on the Canadian DSL
Australia AICS	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	On the inventory, or in compliance with the inventory
Japan ENCS	:	On the inventory, or in compliance with the inventory
Korea KECI	:	All substances in this product were registered, notified to be registered, or exempted from registration by CPChem through an Only Representative according to K-REACH regulations. Importation of this product is permitted if the Korean Importer of Record was included on CPChem's notifications or if the Importer of Record themselves notified the substances.
Philippines PICCS	:	On the inventory, or in compliance with the inventory
China IECSC	:	On the inventory, or in compliance with the inventory
Taiwan TCSI	:	On the inventory, or in compliance with the inventory

SECTION 16: Other information**Further information**

Legacy SDS Number : 26960

Local emergency contact number: 0532-83889090

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

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

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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.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		