SAFETY DATA SHEET

PRF Isooctane

Version 1.6

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

Product information

Product Name: PRF Isooctane
Material: 1116963, 1020572, 1020570, 1020569, 1031133, 1020567, 1020571

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

Local: 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
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
Standards for classification and labeling of chemical substances and material safety data sheet (ministry of employment and labor public notice No. 2013-37) (GHS 2009)

SDS Number:100000068258 1/12
Classification

: Flammable liquids, Category 2
Skin irritation, Category 2
Specific target organ systemic toxicity - single exposure, Category 3
Aspiration hazard, Category 1
Acute aquatic toxicity, Category 1
Chronic aquatic toxicity, 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.
P261: Avoid breathing dust/fume/gas/mist/vapors/spray.
P273: Avoid release to the environment.

Response:
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353: IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P321: Specific treatment (see supplemental first aid instructions on this label).
P331: Do NOT induce vomiting.
P362: Take off contaminated clothing and wash before reuse.
P370 + P378: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

SECTION 3: Composition/information on ingredients

Synonyms: 2,2,4-Trimethylpentane
ASTM Isooctane Knock Test Reference Fuel
Isooctane (ASTM Grade)
Isooctane
Primary Reference Fuel

Molecular formula: C₈H₁₈

Chemical name | CAS-No. | Concentration | KECl Number
---|---|---|---

SDS Number:100000068258 2/12
PRF Isooctane

SECTION 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.

If inhaled : Consult a physician after significant exposure. If unconscious, place in recovery position and seek medical advice.

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 : 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.

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.

SECTION 5: Firefighting measures

Flash point : \(-12.22 \, ^\circ \text{C} (10.00 \, ^\circ \text{F})\) estimated

Autoignition temperature : \(411 \, ^\circ \text{C} (772 \, ^\circ \text{F})\)

Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.

Unsuitable extinguishing media : High volume water jet.

Specific hazards during firefighting : 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. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.
SAFETY DATA SHEET

PRF Isooctane

Version 1.6

Revision Date 2017-07-26

Hazardous decomposition products : Hydrocarbons. 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 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.

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

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 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 according to the amount and concentration of the dangerous substance at the work place. Wear as appropriate: Flame-resistant clothing. Footwear protecting against chemicals.

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**: Colorless
- **Odor**: Mild

**Safety data**

- **Flash point**: -12.22 °C (10.00 °F) estimated
- **Lower explosion limit**: 1 %(V)
- **Upper explosion limit**: 7 %(V)
Oxidizing properties: no

Autoignition temperature: 411 °C (772 °F)

Molecular formula: C8H18

Molecular weight: 114.26 g/mol

pH: Not applicable

Pour point: No data available

Boiling point/boiling range: 99 °C (210 °F)

Vapor pressure: 1.70 PSI
 at 37.8 °C (100.0 °F)

Relative density: 0.69
 at 15.6 °C (60.1 °F)

Water solubility: Negligible

Partition coefficient: n-octanol/water: No data available

Viscosity, kinematic: 0.503 cSt
 at 20 °C (68 °F)

Relative vapor density: 1
 (Air = 1.0)

Evaporation rate: 1

Percent volatile: > 99 %

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

Conditions to avoid: Heat, sparks, fire, and oxidizing agents.

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

Hazardous decomposition products: Hydrocarbons
 Carbon oxides

Other data: No decomposition if stored and applied as directed.
SECTION 11: Toxicological information

**Acute oral toxicity**
2,2,4-Trimethylpentane (Isooctane): LD50: > 5,000 mg/kg
Species: Rat
Sex: male and female
Method: OECD Test Guideline 401
Symptoms: Salivation

**Acute inhalation toxicity**
2,2,4-Trimethylpentane (Isooctane): LC50: > 33.52 milligram per liter
Exposure time: 4 h
Species: Rat
Sex: male and female
Test atmosphere: vapor
Method: OECD Test Guideline 403

**Acute dermal toxicity**
2,2,4-Trimethylpentane (Isooctane): LD50: > 2000 milligram per kilogram
Species: Rabbit
Sex: male and female
Method: OECD Test Guideline 402

**PRF Isooctane Skin irritation**
: Irritating to skin.

May cause skin irritation in susceptible persons.

**PRF Isooctane Eye irritation**
: No eye irritation

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

**Sensitization**
2,2,4-Trimethylpentane (Isooctane): Does not cause skin sensitization.

**Repeated dose toxicity**
2,2,4-Trimethylpentane (Isooctane):
Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 0, 668, 2220, 6646 ppm
Exposure time: 13 weeks
Number of exposures: 6 hr/day 5 d/wk
NOEL: 8.117 mg/l 2220 ppm
Method: OECD Guideline 413
Information given is based on data obtained from similar substances.

**Reproductive toxicity**
2,2,4-Trimethylpentane: Species: Rat
SAFETY DATA SHEET

PRF Isooctane

Version 1.6

Revision Date 2017-07-26

(Isooctane) Sex: male and female
Application Route: Inhalation
Dose: 0, 900, 3000, 9000 ppm
Number of exposures: 6 h/d 5 d/wk
Method: OECD Test Guideline 416
NOAEL Parent: 3000 ppm
NOAEL F1: 3000 ppm
NOAEL F2: 3000 ppm
Information given is based on data obtained from similar substances.

Developmental Toxicity

2,2,4-Trimethylpentane
(Isooctane) Species: Rat
Application Route: Inhalation
Dose: 0, 400, 1200 ppm
Number of exposures: 6h/d
Test period: GD6-15
NOAEL Teratogenicity: 1200 ppm
NOAEL Maternal: 1200 ppm
Information given is based on data obtained from similar substances.

Species: Rat
Application Route: Inhalation
Dose: 0, 900, 3000, 9000 ppm
Number of exposures: 6h/d
Test period: GD6-15
Method: OECD Guideline 414
NOAEL Teratogenicity: 9000 ppm
NOAEL Maternal: 3000 ppm
Information given is based on data obtained from similar substances.

PRF Isooctane

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

2,2,4-Trimethylpentane
(Isooctane) 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: Animal testing did not show any effects on fertility.

PRF Isooctane

Further information 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.

SECTION 12: Ecological information

SDS Number: 1000000068258
8/12
Toxicity to fish

2,2,4-Trimethylpentane (Isooctane) : LC50: 0.11 mg/l
Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)
semi-static test Method: OECD Test Guideline 203
Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates

2,2,4-Trimethylpentane (Isooctane) : EC50: 0.4 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
static test Information given is based on data obtained from similar substances.

Toxicity to algae

2,2,4-Trimethylpentane (Isooctane) : EL50: 2.943 mg/l
Exposure time: 72 h
Method: QSAR modeled data

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

2,2,4-Trimethylpentane (Isooctane) : NOEC: 0.17 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)

Biodegradability

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

Ecotoxicology Assessment

Acute aquatic toxicity
2,2,4-Trimethylpentane (Isooctane) : Very toxic to aquatic life.

Chronic aquatic toxicity
2,2,4-Trimethylpentane (Isooctane) : Very toxic to aquatic life with long lasting effects.

Results of PBT assessment
2,2,4-Trimethylpentane (Isooctane) : 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.
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)
UN1262, OCTANES, (2,2,4-TRIMETHYPENTANE (ISOOCTANE)), 3, II, MARINE POLLUTANT, (2,2,4-TRIMETHYPENTANE (ISOOCTANE)), RQ (2,2,4-TRIMETHYPENTANE (ISOOCTANE))

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN1262, OCTANES, 3, II, (-12.22 °C), MARINE POLLUTANT, (2,2,4-TRIMETHYPENTANE (ISOOCTANE))

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN1262, OCTANES, 3, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN1262, OCTANES, 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (2,2,4-TRIMETHYPENTANE (ISOOCTANE))

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN1262, OCTANES, 3, II, ENVIRONMENTALLY HAZARDOUS, (2,2,4-TRIMETHYPENTANE (ISOOCTANE))
SAFETY DATA SHEET

PRF Isooctane

Version 1.6

Revision Date 2017-07-26

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN1262, OCTANES, 3, II, ENVIRONMENTALLY HAZARDOUS, (2,2,4-TRIMETHYPENTANE (ISOOCTANE))

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

SECTION 15: Regulatory information

National legislation

Regulation under the Occupational Safety and Health Act
A Material Safety Datasheet (MSDS) for this product is not required according to article 41 of the ISHA.

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<thead>
<tr>
<th>Regulation</th>
<th>Chemical name</th>
<th>Threshold limits</th>
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</thead>
<tbody>
<tr>
<td>Harmful Substances Prohibited from Manufacturing</td>
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<tr>
<td>Harmful Substances Required Permission for Manufacture</td>
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Act on the Registration and Evaluation, etc. of Chemical Substances, Chemicals Control Act

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<th>Regulation</th>
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<td>Prohibited Chemicals</td>
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<tr>
<td>Toxic Release Inventory</td>
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Dangerous Substances Safety Management Act

Dangerous Substances Safety Management Act

<table>
<thead>
<tr>
<th>Dangerous Substances Safety Management Act</th>
<th>Threshold limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable liquids, Type 1 petroleums, Water insoluble liquid</td>
<td></td>
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</tbody>
</table>

Notification status

Europe REACH: On the inventory, or in compliance with the inventory
United States of America (USA) TSCA: On the inventory, or in compliance with the inventory
Canada DSL: On the inventory, or in compliance with the inventory
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: On the inventory, or in compliance with the inventory
Philippines PICCS: On the inventory, or in compliance with the inventory
China IECSC: On the inventory, or in compliance with the inventory
Further information
Legacy SDS Number : 26040

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 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% | | |