Safety Data Sheet (SDS)

Section 1 – Identification

Product identifier: REG Renewable Propane (Non-odorized)

Other means of identification:

Synonyms:
Bio-Derived LPG, Propane-Butane Mixture, Renewable Liquefied Petroleum Gas, Renewable LPG (non-odorized), Renewable Autogas, LPG, Renewable Propane

Recommended use:
Burner fuel, fuel for combustion engines, industrial feedstock, industrial blendstock

Restrictions on use:
Not intended for human consumption

Supplier information:
REG Marketing & Logistics Group, LLC
416 S. Bell Ave.
Ames, IA 50010
(888) 734-8686

Emergency phone number:
Call ChemTel LLC for emergency service 24 hours a day
(800) 255-3924 (North America)
+1 (813) 248-0585 (International)

Section 2 – Hazard(s) Identification

Classification (in accordance with 29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Hazard Class</th>
<th>Hazard Category</th>
<th>Route of Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable Gases</td>
<td>Category 1</td>
<td>Physical Hazard</td>
</tr>
<tr>
<td>Gases Under Pressure</td>
<td>Liquefied Gas</td>
<td>Physical Hazard</td>
</tr>
<tr>
<td>Simple Asphyxiant</td>
<td>None</td>
<td>Inhalation</td>
</tr>
</tbody>
</table>

Signal word: Danger

Pictograms:

Hazard Statements:
H220 Extremely flammable gas, which may form explosive mixtures with air.
H280 Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation

Precautionary statements:

Prevention:
Keep away from heat, sparks, open flames, hot surfaces, and other potential ignition sources. No smoking. Ground / bond container and receiving equipment and take precautionary measures against static discharge – including the use of non-sparking tools and explosion-proof equipment. Wear appropriate protective gloves, protective garments, and eye protection. Avoid breathing mists and sprays.

Response:
Leaking gas fire: Do not extinguish, unless leak can be safely stopped. Eliminate all ignition sources if safe to do so.
Storage
Protect from sunlight. Store in well-ventilated place.

Disposal
Dispose of contents/container in accordance with local, state, and federal regulations.

Hazards not otherwise specified
Contact with liquid may cause cold burns or frostbite.

Ingredient(s) with unknown acute toxicity (if ≥ 1%)
This product is not classified based on testing of the mixture as a whole. Up to 100% of this mixture contains ingredients of unknown acute toxicity.

Section 3 – Composition / Information on Ingredients

Note: This SDS represents a product with batch-to-batch variability and/or a group of substantially similar mixtures

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Common Name &amp; Synonyms</th>
<th>CAS number</th>
<th>% of product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propane</td>
<td>Liquefied petroleum gas, LPG</td>
<td>74-98-6</td>
<td>&gt;75%</td>
</tr>
<tr>
<td>n-Butane</td>
<td>Butane</td>
<td>106-97-8</td>
<td>&lt;25%</td>
</tr>
<tr>
<td>2-methyl propane</td>
<td>Isobutane</td>
<td>75-28-5</td>
<td>&lt;25%</td>
</tr>
<tr>
<td>2-methyl butane</td>
<td>Isopentane</td>
<td>78-78-4</td>
<td>&lt;5%</td>
</tr>
</tbody>
</table>

Section 4 – First-Aid Measures

First-aid measures for exposure

Inhalation
Remove patient from exposure. If breathing difficulties develop, move victim away from source of exposure and into fresh air. If not breathing, give artificial respiration. Seek medical attention.

Skin
Liquefied gases may cause cryogenic burns or injury. Treat burned or frostbitten skin by flushing or immersing the affected area(s) in lukewarm water. Do not rub affected area. Do not remove clothing that adheres due to freezing. After sensation has returned to the frostbitten skin, keep skin warm, dry, and clean. If blistering occurs, apply a sterile dressing. Seek immediate medical attention.

Eyes
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation persists: Get medical attention.

Ingestion
Due to the product’s nature to rapidly phase change to vapor at ambient temperature and cryogenic nature, ingestion is not considered a potential route of exposure.

Most important symptoms / effects

Acute
May cause cryogenic burns or injury. Product may displace oxygen and cause rapid suffocation.

Delayed / Chronic
No information available.

Indication of immediate medical attention
Treat symptomatically and supportively. Note: Due to the potentially cryogenic nature of the product, it may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Special treatment needed, if necessary
No information available.
Section 5 – Fire-Fighting Measures

Suitable extinguishing media
Water mist, firefighting foam, dry chemical, carbon dioxide, or clean extinguishing agents (such as Halon or Halotron).

Unsuitable extinguishing media
Do not use a solid water stream, as it may scatter and spread the fire.

Specific hazards arising from the chemical
Contains extremely flammable gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Hazardous combustion products include
Carbon monoxide, carbon dioxide, and hydrocarbons.

Protective equipment and precautions for firefighters
Promptly isolate the scene by removing all persons from the vicinity of the incident. No action shall be taken involving any personal risk or without suitable training. If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive re-ignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device. Emergency responders in the immediate area should wear standard firefighting protective equipment, including self-contained breathing apparatus (SCBA) and full bunker gear. In case of external fires in proximity to storage containers, immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. Fight fire from protected location or maximum possible distance. Prevent runoff from entering streams, sewers, storm drains, or drinking water supply.

Section 6 – Accidental Release Measures

Personal precautions, protective equipment, and emergency procedures
Keep all sources of ignition away from spill. Wear protective garments, impervious oil resistant boots, protective chemical-resistant gloves, and safety glasses. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Evacuate area. Ensure adequate air ventilation. Stop leak if safe to do so. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Contain spill to smallest possible area. Stay upwind and away from spill/release, notify persons downwind of spill/release. Stop spill/release if it can be done with minimal risk. Prevent spilled material from entering sewers, storm drains, and other unauthorized treatment drainage systems and natural waterways. Immediate cleanup of any spill is recommended. If material spills into or upon any navigable waters and causes a film or sheen on the surface of the water, immediately notify the National Response Center at 1-800-424-8802.

Methods for containment and clean-up

Small spill / incidental release
Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill / release
Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Other information
Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Section 7 – Handling and Storage

Precautions for safe handling
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment. Can accumulate static charge by flow or agitation. Can be ignited by static discharge. Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents.

Conditions for safe storage, including incompatibilities
Store only where temperature will not exceed 125°F (52°C). Post “No Smoking or Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g., NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

Section 8 – Exposure Controls / Personal Protection

Precautions for safe handling
A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Component exposure limits

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propane</td>
<td>74-98-6</td>
<td>PEL: 1000 ppm (1800 mg/m³) TWA</td>
<td>1000 ppm TWA</td>
<td>&gt;75%</td>
</tr>
<tr>
<td>Butane</td>
<td>106-97-8</td>
<td>REL: 800 ppm (1,900 mg/m³) TWA</td>
<td>800 ppm TWA</td>
<td>&lt;25%</td>
</tr>
<tr>
<td>Iso-Butane</td>
<td>75-28-5</td>
<td>(NIOSH REL) 1000 ppm TWA</td>
<td>None</td>
<td>&lt;25%</td>
</tr>
<tr>
<td>Isopentane</td>
<td>78-78-4</td>
<td>None</td>
<td>600 ppm TWA</td>
<td>&lt;5%</td>
</tr>
</tbody>
</table>

Appropriate engineering controls
Keep product enclosed in primary containment (hoses, pipes, tanks, etc.) to avoid contact with skin. Handle in accordance with good industrial hygiene and safety practices.

Individual Protection Measures

Personal protective equipment
Eyes / face

Wear safety glasses. If splash potential exists, use splash goggles to safeguard against potential eye contact, irritation, or injury. A face shield may be necessary, depending on conditions of use.

Skin

Wear flame retardant clothing (FRC), boots and chemical resistant or leather gloves. See glove manufacturer literature for information on permeability to paraffinic solvents. Inspect gloves, boots and clothing for defect prior to and during use. After removing gloves, wash hands with soap and water.

Respiratory

Use a positive pressure air-supplied respirator (self-contained breathing apparatus – SCBA respiratory protection program that meets regulatory requirements (OSHA’s 29 CFR 1910.134 and ANSI Z88.2) must be followed whenever workplace conditions warrant a respirator’s use.

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**Section 9 – Physical and Chemical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance - Physical State</td>
<td>Gas (at atmospheric pressure)</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless to mild paraffin</td>
</tr>
<tr>
<td>pH</td>
<td>No information available</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>-44° C (-47° F)</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No information available</td>
</tr>
<tr>
<td>LFL</td>
<td>~1% by volume</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>~130 psi</td>
</tr>
<tr>
<td>Relative Density@ 15° C</td>
<td>No information available</td>
</tr>
<tr>
<td>Solubility (H2O):</td>
<td>Slightly soluble</td>
</tr>
<tr>
<td>Auto Ignition Temp.:</td>
<td>~460° C (~860° F)</td>
</tr>
<tr>
<td>Viscosity @ 40° C:</td>
<td>No information available</td>
</tr>
<tr>
<td>Appearance - Color:</td>
<td>Colorless gas / liquid – white vapor</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
<td>No information available</td>
</tr>
<tr>
<td>Flash Point:</td>
<td>&lt; 50° C (&lt; 58° F)</td>
</tr>
<tr>
<td>Flammability (solid/gas):</td>
<td>Highly flammable gas</td>
</tr>
<tr>
<td>LFL:</td>
<td>~9.5% by volume</td>
</tr>
<tr>
<td>UFL:</td>
<td>&gt;1 (air=1)</td>
</tr>
<tr>
<td>Volatile Organic Compounds:</td>
<td>100%</td>
</tr>
<tr>
<td>Solubility (other):</td>
<td>No information available</td>
</tr>
<tr>
<td>Decomposition Temp.:</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water):</td>
<td>Log Pow: 2.36</td>
</tr>
</tbody>
</table>

**Section 10 – Stability and Reactivity**

Reactivity

When handled and stored appropriately, no dangerous reactions are known.

Chemical stability

Stable in closed containers at room temperature under normal storage and handling conditions. Extremely flammable. Vapor can cause flash fire if it comes into contact with an ignition source.

Possibility of hazardous reactions

Can form explosive atmosphere in air. May react violently with strong acids and strong oxidizers.

Conditions to avoid

Ignition sources or accumulation of static electricity.

Incompatible materials

Keep away from strong oxidizing agents, strong reducing agents, strong acids, and strong bases.

Hazardous decomposition products

Carbon oxides, hydrogen sulfide, nitrogen oxides, and hydrocarbons.

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**Section 11 – Toxicological Information**

Likely routes of exposure

Absorption, ingestion, and inhalation.

Symptoms

Inhalation

Coughing, irritation, or asphyxiation.
Ingestion
Due to the product’s nature to rapidly phase change to vapor at ambient temperature and cryogenic nature, ingestion is not considered a potential route of exposure.

Skin contact
Redness or irritation. Liquefied gases may cause cryogenic burns or injury.

Eye contact
Redness or irritation and tearing. Liquefied gases may cause cryogenic burns or injury.

Acute toxicity

Oral
No information available.

Dermal
No information available.

Inhalation

**Propane (74-98-6)**

<table>
<thead>
<tr>
<th>LC50 inhalation rat (mg/l)</th>
<th>658 mg/l/4h</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATE US (vapors)</td>
<td>658.000 mg/l/4h</td>
</tr>
<tr>
<td>ATE US (dust, mist)</td>
<td>658.000 mg/l/4h</td>
</tr>
</tbody>
</table>

Liquefied petroleum gas acts as a simple asphyxiant, acts by displacing oxygen in the lungs thereby diminishing the supply of oxygen available to the blood and tissue.

Skin corrosion / irritation
Direct contact with skin, mucous membranes or eyes with liquefied product or cold vapor may cause freeze burns and frostbite.

Serious eye damage / eye irritation
Direct contact with skin, mucous membranes or eyes with liquefied product or cold vapor may cause freeze burns and frostbite.

Sensitization (Respiratory or Skin)
No information available.

Germ cell mutagenicity
No information available.

Carcinogenicity
This product is not listed as a carcinogen by IARC, NTP, or OSHA.

Component carcinogenicity
No information available.

Reproductive / developmental toxicity
No information available.

Specific target organ toxicity

Single exposure
No information available.

Repeated exposure
No information available.

Aspiration hazard
No information available.

**Section 12 – Ecological Information**

Acute ecotoxicity – short or long-term exposure
There is a potential for one ingredient (iso-pentane, <5%) to cause long-term adverse effects on aquatic environments. Other ingredients of this product have no known ecological damage.

Fish
No information available.

Invertebrates
No information available.

Algae
No information available.
Persistence and degradability

This substance is biodegradable, and is unlikely to persist.

Bioaccumulative potential

Not expected to bio accumulate.

Mobility in soil

Because of its high volatility, the product is unlikely to cause ground or water pollution.

Other adverse effects

None.

Section 13 – Disposal Considerations

Disposal (waste / unwanted product)

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Disposal (containers with residue)

Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container. Dispose of all containers with residue according to local, state, regional, and federal regulations.

Section 14 – Transport Information

DOT

<table>
<thead>
<tr>
<th>ID Number</th>
<th>UN 1978 (Domestic only: UN/NA 1075)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN Proper Shipping Name</td>
<td>Propane</td>
</tr>
<tr>
<td>Transport Hazard Class(es)</td>
<td>2.1</td>
</tr>
<tr>
<td>Packing Group</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Placard</td>
<td>Flammable Gas</td>
</tr>
<tr>
<td>Marine Pollutant</td>
<td>No</td>
</tr>
<tr>
<td>Transport in Bulk Requirements</td>
<td>No information available</td>
</tr>
<tr>
<td>Special Transportation Provisions</td>
<td>19, T50</td>
</tr>
<tr>
<td>Special Note</td>
<td>No information available</td>
</tr>
</tbody>
</table>

Shipping Label

Placard

(Shipment by truck or rail in bulk)
Section 15 – Regulatory Information

Inventory Listings

- DSL: ☒ Listed  ☐ Exempt
- TSCA: ☒ Listed  ☐ Exempt

U.S. Federal Regulations

- EPA (CERCLA) reportable quantity: none

Clean Air Act section 112, Threshold Quantities:
- Propane (CAS# 74-98-6); 10,000 lbs
- Butane (CAS# 106-97-8); 10,000 lbs
- i-Butane (CAS# 75-28-5); 10,000 lbs
- i-Pentane (CAS# 78-78-4); 10,000 lbs

Clean Water Act: This product does not contain any chemicals regulated as toxic pollutants pursuant to the Clean Water Act (40 CFR 401.15) when used as recommended.

SARA 311/312 Hazard Categories:

<table>
<thead>
<tr>
<th>Hazard Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable Gases</td>
</tr>
<tr>
<td>Gases Under Pressure</td>
</tr>
<tr>
<td>Simple Asphyxiant</td>
</tr>
<tr>
<td>☒ Hazard Not Otherwise Classified (HNOC) – see Section 2 for more information</td>
</tr>
</tbody>
</table>

U.S. State Regulations

- California Proposition 65:
  ☒ This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propane</td>
<td>74-98-6</td>
</tr>
</tbody>
</table>

Section 16 – Other Information

Issuing Date: Jan 07, 2014
Revision Date: March 10th, 2022
Version #: 20220310
Revision Note: Updated REG logo.
WARNING: POTENTIALLY HAZARDOUS MATERIAL. IMPROPER USE OR MISHANDLING CAN RESULT IN SERIOUS INJURY OR DEATH. THIS PRODUCT CONTAINS SUBSTANCES WHICH, IF MODIFIED, MAY BE FLAMMABLE AND MAY BURN OR EXPLODE IF HEATED OR EXPOSED TO FLAME OR OTHER IGNITION SOURCE OR WATER, OXIDIZING AGENTS, ACIDS OR OTHER CHEMICALS. AVOID INGESTION, INHALATION AND CONTACT WITH SKIN AND EYES.

Disclaimer:

The information provided on this SDS 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.

End of SDS