1. Identification

Product identifier: Mixed P-P's (Propane/Propylene)

Other means of identification:
- SDS number: 308
- Synonyms: Blend Of Propane and Propylene, Refinery Grade Propylene
  See section 16 for complete information.

Recommended use: Organic synthesis. Household and industrial fuel.

Recommended restrictions: None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer/Supplier: Valero Marketing & Supply Company and Affiliates
One Valero Way
San Antonio, TX 78269-6000

General Assistance: 210-345-4593
E-Mail: CorpHSE@valero.com
Contact Person: Industrial Hygienist

Emergency Telephone: 24 Hour Emergency 866-565-5220
1-800-424-9300 (CHEMTREC USA)

2. Hazard(s) identification

Physical hazards:
- Category 1 Flammable gases
- Gases under pressure Liquefied gas

Health hazards: Not classified.

OSHA defined hazards: Simple asphyxiant

Label elements:

Signal word: Danger
Hazard statement: Extremely flammable gas. Contains gas under pressure; may explode if heated.

Precautionary statement:
- Prevention: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- Response: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.
- Storage: Protect from sunlight. Store in a well-ventilated place.
- Disposal: Dispose of waste and residues in accordance with local authority requirements.

Hazard(s) not otherwise classified (HNOC): None known.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene</td>
<td>115-07-1</td>
<td>50 - 80</td>
</tr>
<tr>
<td>Propane</td>
<td>74-98-6</td>
<td>20 - 40</td>
</tr>
<tr>
<td>Ethane</td>
<td>74-84-0</td>
<td>0 - 10</td>
</tr>
<tr>
<td>Ethylene</td>
<td>74-85-1</td>
<td>0 - 10</td>
</tr>
</tbody>
</table>
4. First-aid measures

**Inhalation**
Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Call a physician or poison control center immediately.

**Skin contact**
Wash frost-bitten areas with plenty of water. Do not remove clothing. Get medical attention immediately.

**Eye contact**
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

**Ingestion**
Ingestion is not a typical route of exposure for gases or liquefied gases.

**Most important symptoms/effects, acute and delayed**

**Indication of immediate medical attention and special treatment needed**
Treat symptomatically.

5. Fire-fighting measures

**Suitable extinguishing media**
Dry chemical, CO2, water spray, fog, or foam.

**Unsuitable extinguishing media**
Not available.

**Specific hazards arising from the chemical**
Extremely flammable gas. During fire, gases hazardous to health may be formed. Vapors are heavier than air and may travel along the ground to some distant source of ignition and flash back.

**Special protective equipment and precautions for firefighters**
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Fire-fighting equipment/instructions**
Self-contained breathing apparatus, operated in positive pressure mode and full protective clothing must be worn in case of fire.

Move container from fire area if it can be done without risk.

Do not extinguish fires unless gas flow can be stopped safely; explosive re-ignition may occur. 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. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus. Stop flow of material. Use water to keep fire exposed containers cool and to protect personnel effecting shutoff. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop leak. Prevent runoff from fire control or dilution from entering streams, sewers or drinking water supply.

6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**
Evacuate the area promptly. No action shall be taken involving any personal risk or without suitable training. Keep unnecessary personnel away.

Ensure adequate ventilation. In case of inadequate ventilation, use respiratory protection. Wear appropriate personal protective equipment (See Section 8).

**Methods and materials for containment and cleaning up**
Ventilate well, stop flow of gas or liquid if possible. Immediately contact emergency personnel.

**Environmental precautions**
Should not be released into the environment. Prevent further leakage or spillage if safe to do so. Prevent from entering into soil, ditches, sanitary sewers, waterways and/or groundwater.

7. Handling and storage

**Precautions for safe handling**
Eliminate sources of ignition. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Wear appropriate personal protective equipment (See Section 8). Eating, drinking, and smoking should be prohibited in areas where this material is handled, stored, and processed. Do not breathe gas. Do not get in eyes, on skin, on clothing. Use only with adequate ventilation.

**Conditions for safe storage, including any incompatibilities**
Store in accordance with local, regional, national, and international regulations. Secure cylinders in an upright position at all times, close all valves when not in use. Store in a cool, dry, well-ventilated place. Keep container tightly closed and sealed until ready for use. Protect cylinders from damage.
8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propane (CAS 74-98-6)</td>
<td>PEL</td>
<td>1800 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000 ppm</td>
</tr>
</tbody>
</table>

US. ACGIH Threshold Limit Values

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene (CAS 74-85-1)</td>
<td>TWA</td>
<td>200 ppm</td>
</tr>
<tr>
<td>Isobutane (CAS 75-28-5)</td>
<td>STEL</td>
<td>1000 ppm</td>
</tr>
<tr>
<td>Propylene (CAS 115-07-1)</td>
<td>TWA</td>
<td>500 ppm</td>
</tr>
</tbody>
</table>

US. NIOSH: Pocket Guide to Chemical Hazards

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isobutane (CAS 75-28-5)</td>
<td>TWA</td>
<td>1900 mg/m³</td>
</tr>
<tr>
<td>Propane (CAS 74-98-6)</td>
<td>TWA</td>
<td>1800 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>800 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000 ppm</td>
</tr>
</tbody>
</table>

Biological limit values
No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. The engineering controls also need to keep gas, vapor, or dust concentrations below any lower explosive limits.

Individual protection measures, such as personal protective equipment

Eye/face protection
Wear approved safety glasses or goggles.

Skin protection
Hand protection
Wear appropriate chemical resistant gloves.

Other
Wear protective clothing appropriate for the risk of exposure.

Respiratory protection
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

Thermal hazards
Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations
Do not eat, drink or smoke when using the product. Wash thoroughly after handling. Provide eyewash station and safety shower. Handle in accordance with good industrial hygiene and safety practices.

9. Physical and chemical properties

Appearance
Colorless liquefied gas.

Physical state
Gas.

Form
Compressed liquefied gas.

Color
Colorless

Odor
Odorless (but may have skunk odor added).

Odor threshold
Not available.

pH
Not available.

Melting point/freezing point
-299 °F (-183.89 °C) Weighted average

Initial boiling point and boiling range
-43.96 - 11.12 °F (-42.2 - -11.6 °C)

Flash point
-212.5 °F (-135.9 °C) Closed Cup (Ethylene)

Evaporation rate
Not available.

Flammability (solid, gas)
Not available.

Upper/lower flammability or explosive limits

| Flammability limit - lower (%) | 1 % |
| Flammability limit - upper (%) | 9.5 % |
Explosive limit - lower (%)  Not available.
Explosive limit - upper (%)  Not available.
Vapor pressure  Not available.
Vapor density  1.6
Relative density  0.52
Solubility(ies)
  Solubility (water)  Insoluble.
Partition coefficient
  (n-octanol/water)  Not available.
Auto-ignition temperature  > 500 °F (> 260 °C)
Decomposition temperature  Not available.
Viscosity  Not available.
Other information
  VOC (Weight %)  100 %

10. Stability and reactivity
Reactivity  Not available.
Chemical stability  Stable under normal temperature conditions and recommended use.
Possibility of hazardous reactions  Polymerization will not occur.
Conditions to avoid  In a fire or if heated, a pressure increase will occur and the container may burst or explode.
Hazardous decomposition products  No hazardous decomposition products are known.

11. Toxicological information
Information on likely routes of exposure
  Ingestion  Not likely, due to the form of the product.
  Inhalation  Breathing of high concentrations may cause dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness. Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels.
  Skin contact  Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.
  Eye contact  Contact with liquefied gas may cause frostbite.
Symptoms related to the physical, chemical and toxicological characteristics  Narcosis. Behavioral changes. Decrease in motor functions.

Information on toxicological effects
Acute toxicity  Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene (CAS 74-85-1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td>Mouse</td>
<td>1093 mg/l</td>
</tr>
<tr>
<td>LD50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propane (CAS 74-98-6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inhalation</td>
<td>Rat</td>
<td>&gt; 1442 mg/l, 15 Minutes</td>
</tr>
</tbody>
</table>
Propylene (CAS 115-07-1)

**Acute**

- **Inhalation**
  - **LC50**
    - Mouse: 680 mg/l, 2 Hours
    - Rat: 658 mg/l, 4 Hours

**Skin corrosion/irritation**

Contact with liquefied gas might cause frostbites, in some cases with tissue damage.

**Serious eye damage/eye irritation**

Direct contact with liquefied gas may cause eye damage from frostbite.

**Respiratory or skin sensitization**

- **Respiratory sensitization**
  - Based on available data, the classification criteria are not met.
- **Skin sensitization**
  - Not a skin sensitizer.
- **Germ cell mutagenicity**
  - Based on available data, the classification criteria are not met.

**Carcinogenicity**

- **IARC Monographs. Overall Evaluation of Carcinogenicity**
  - Ethylene (CAS 74-85-1): 3 Not classifiable as to carcinogenicity to humans.
  - Propylene (CAS 115-07-1): 3 Not classifiable as to carcinogenicity to humans.

**Reproductive toxicity**

Based on available data, the classification criteria are not met.

**Specific target organ toxicity - single exposure**

Based on available data, the classification criteria are not met.

**Specific target organ toxicity - repeated exposure**

Based on available data, the classification criteria are not met.

**Aspiration hazard**

Based on available data, the classification criteria are not met.

**Chronic effects**

May cause central nervous system effects.

**12. Ecological information**

**Ecotoxicity**

Not expected to be harmful to aquatic organisms.

**Persistence and degradability**

Not available.

**Bioaccumulative potential**

**Partition coefficient n-octanol / water (log Kow)**

- Ethane (CAS 74-84-0): 1.81
- Ethylene (CAS 74-85-1): 1.13
- Propane (CAS 74-98-6): 2.36
- Propylene (CAS 115-07-1): 1.77

**Mobility in soil**

Not available.

**Other adverse effects**

Not available.

**13. Disposal considerations**

**Disposal instructions**

Dispose in accordance with all applicable regulations. Empty containers may contain product residues. Do not puncture or incinerate even when empty. This material and/or its container must be disposed of as hazardous waste. Return the empty cylinder to the supplier.

**Hazardous waste code**

D001: Waste Flammable material with a flash point <140 °F

**Waste from residues / unused products**

Dispose of in accordance with local regulations.

**Contaminated packaging**

Since emptied containers may retain product residue, follow label warnings even after container is emptied.

**14. Transport information**

**DOT**

- **UN number**: UN1075
- **UN proper shipping name**: Petroleum gases, liquefied
- **Transport hazard class(es)**
  - **Class**: 2.1
  - **Subsidiary risk**: -
  - **Packing group**: Not applicable.

**Special precautions for user**

Read safety instructions, SDS and emergency procedures before handling.
Special provisions
Packaging exceptions
Packaging non bulk
Packaging bulk

IATA
UN number
UN proper shipping name
Transport hazard class(es)
  Class
  Subsidiary risk
  Label(s)
Packing group
Environmental hazards
ERG Code
Special precautions for user

IMDG
UN number
UN proper shipping name
Transport hazard class(es)
  Class
  Subsidiary risk
  Label(s)
Packing group
Environmental hazards
Marine pollutant
EmS
Special precautions for user

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

15. Regulatory information
US federal regulations
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)
Ethane (CAS 74-84-0) LISTED
Ethylene (CAS 74-85-1) LISTED
Isobutane (CAS 75-28-5) LISTED
Propane (CAS 74-98-6) LISTED
Propylene (CAS 115-07-1) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)
Hazard categories
Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - Yes
Pressure Hazard - Yes
Reactivity Hazard - No

SARA 302 Extremely hazardous substance
Not listed.

SARA 311/312 Hazardous chemical
Yes

SARA 313 (TRI reporting)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>% by wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene</td>
<td>115-07-1</td>
<td>50 - 80</td>
</tr>
</tbody>
</table>
Ethylene 74-85-1 0 - 10

### Other federal regulations

#### Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

#### Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

- Ethane (CAS 74-84-0)
- Ethylene (CAS 74-85-1)
- Isobutane (CAS 75-28-5)
- Propane (CAS 74-98-6)
- Propylene (CAS 115-07-1)

#### Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)

Hazardous substance

#### Safe Drinking Water Act (SDWA)

Not regulated.

### US state regulations

#### US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

WARNING: Byproducts of the combustion of propane contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

California requires all "persons in the course of doing business" whose products are sold in California to comply with Proposition 65 (Cal. Health and Safety Code Sections 25249.6 et seq.). Accordingly, resellers of this product in California shall comply with Proposition 65, including the provision of any necessary warnings for exposure to chemicals listed by the State of California: http://oehha.ca.gov/prop65/prop65_list/files/P65single111811.pdf

#### US. Massachusetts RTK - Substance List

- Ethane (CAS 74-84-0)
- Ethylene (CAS 74-85-1)
- Isobutane (CAS 75-28-5)
- Propane (CAS 74-98-6)
- Propylene (CAS 115-07-1)

#### US. New Jersey Worker and Community Right-to-Know Act

- Ethane (CAS 74-84-0)
- Ethylene (CAS 74-85-1)
- Isobutane (CAS 75-28-5)
- Propane (CAS 74-98-6)
- Propylene (CAS 115-07-1)

#### US. Pennsylvania Worker and Community Right-to-Know Law

- Ethane (CAS 74-84-0)
- Ethylene (CAS 74-85-1)
- Isobutane (CAS 75-28-5)
- Propane (CAS 74-98-6)
- Propylene (CAS 115-07-1)

#### US. Rhode Island RTK

- Ethane (CAS 74-84-0)
- Ethylene (CAS 74-85-1)
- Isobutane (CAS 75-28-5)
- Propane (CAS 74-98-6)
- Propylene (CAS 115-07-1)

#### US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Not listed.

### International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>Country(s) or region</td>
<td>Inventory name</td>
<td>On inventory (yes/no)</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Korea</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A “Yes” indicates this product complies with the inventory requirements administered by the governing country(s). A “No” indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

<table>
<thead>
<tr>
<th>Issue date</th>
<th>27-June-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision date</td>
<td>23-May-2014</td>
</tr>
<tr>
<td>Version #</td>
<td>02</td>
</tr>
<tr>
<td>Further information</td>
<td>HMIS® is a registered trade and service mark of the NPCA.</td>
</tr>
</tbody>
</table>

NFPA Ratings

![NFPA Ratings Diagram]

Disclaimer

This material Safety Data Sheet (SDS) was prepared in accordance with 29 CFR 1910.1200 by Valero Marketing & Supply Co., ("VALERO"). VALERO does not assume any liability arising out of product use by others. The information, recommendations, and suggestions presented in this SDS are based upon test results and data believed to be reliable. The end user of the product has the responsibility for evaluating the adequacy of the data under the conditions of use, determining the safety, toxicity and suitability of the product under these conditions, and obtaining additional or clarifying information where uncertainty exists. No guarantee expressed or implied is made as to the effects of such use, the results to be obtained, or the safety and toxicity of the product in any specific application. Furthermore, the information herein is not represented as absolutely complete, since it is not practicable to provide all the scientific and study information in the format of this document, plus additional information may be necessary under exceptional conditions of use, or because of applicable laws or government regulations.