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

1.1. Product identifier
Trade name or designation of the mixture: Propane gas
Registration number: -
Synonyms: None.
SDS number: WC002
Issue date: 19-December-2019
Version number: 01
Revision date: -
Supersedes date: -

1.2. Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Soldering and brazing.
Uses advised against: None known.

1.3. Details of the supplier of the safety data sheet
Manufacturer/Supplier: Worthington Cylinder Corporation
Address: 300 E. Breed St., Chilton, WI 53014
United States
Contact person: Ann Stiefvater
E-mail address: Ann.Stiefvater@worthingtonindustries.com
Telephone number: 1-920-849-1740
Emergency telephone number: 1-703-527-3887 International / CHEMTREC 1-800-424-9300 Domestic

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
The mixture has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Regulation (EC) No 1272/2008 as amended

Physical hazards
- Flammable gases (including chemically unstable gases) - Category 1 - H220 - Extremely flammable gas.
- Gases under pressure - Liquefied gas - H280 - Contains gas under pressure; may explode if heated.

Hazard summary: Contents under pressure. Heat may cause the containers to explode. Vapours may cause a flash fire or ignite explosively. May displace oxygen and cause rapid suffocation. Not classified for health hazards. However, occupational exposure to the mixture or substance(s) may cause adverse health effects.

2.2. Label elements
Label according to Regulation (EC) No. 1272/2008 as amended

Signal word: Danger

Hazard statements
H220: Extremely flammable gas.
H280: Contains gas under pressure; may explode if heated.

Precautionary statements
Prevention
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Response
P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
In case of leakage, eliminate all ignition sources.

Storage
P410 + P403
Protect from sunlight. Store in a well-ventilated place.

Disposal
Not assigned.

Supplemental label information
None.

2.3. Other hazards
May displace oxygen and cause rapid suffocation. This mixture does not contain substances assessed to be vPvB / PBT according to Regulation (EC) No 1907/2006, Annex XIII.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

General information

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>%</th>
<th>CAS-No. / EC No.</th>
<th>REACH Registration No.</th>
<th>Index No.</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propane</td>
<td>87.5 - 100</td>
<td>74-98-6</td>
<td>200-827-9</td>
<td>-</td>
<td>601-003-00-5</td>
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<td>Classification:</td>
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<tr>
<td>Propylene</td>
<td>0 - 10</td>
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<td>204-062-1</td>
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<td>Ethane</td>
<td>0 - 7</td>
<td>74-84-0</td>
<td>200-814-8</td>
<td>-</td>
<td>601-002-00-X</td>
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<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butane</td>
<td>0 - 2.5</td>
<td>106-97-8</td>
<td>203-448-7</td>
<td>-</td>
<td>601-004-01-8</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List of abbreviations and symbols that may be used above
Note C: Some organic substances may be marketed either in a specific isomeric form or as a mixture of several isomers. In this case the supplier must state on the label whether the substance is a specific isomer or a mixture of isomers.

Note U (Table 3.1): When put on the market gases have to be classified as "Gases under pressure", in one of the groups compressed gas, liquefied gas, refrigerated liquefied gas or dissolved gas. The group depends on the physical state in which the gas is packaged and therefore has to be assigned case by case.

Composition comments
Contains <0.005% Ethyl mercaptan (CAS 75-08-1) as an odorant. The full text for all H-statements is displayed in section 16.
Gas concentrations are in percent by volume.

SECTION 4: First aid measures

General information
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

4.1. Description of first aid measures

Inhalation
Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory tract irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

Skin contact
Not likely, due to the form of the product. If frostbite occurs, immerse affected area in warm water (not exceeding 105°F/41°C). Keep immersed for 20 to 40 minutes. Get medical attention immediately.

Eye contact
Not likely, due to the form of the product. If frostbite occurs, immediately flush eyes with plenty of warm water (not exceeding 105°F/41°C) for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention promptly if symptoms persist or occur after washing.

Ingestion
This material is a gas under normal atmospheric conditions and ingestion is unlikely.

4.2. Most important symptoms and effects, both acute and delayed
Exposure to rapidly expanding gas or vapourizing liquid may cause frostbite ("cold burn"). Very high exposure can cause suffocation from lack of oxygen. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themselves.

4.3. Indication of any immediate medical attention and special treatment needed
Exposure may aggravate pre-existing respiratory disorders. Provide general supportive measures and treat symptomatically.

SECTION 5: Firefighting measures

General fire hazards
Extremely flammable gas. Contents under pressure. Pressurised container may explode when exposed to heat or flame.
5.1. Extinguishing media

Suitable extinguishing media
Dry chemical powder. Carbon dioxide (CO2). Water fog. Foam.

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture
Extremely flammable gas. May form explosive mixtures with air. Gas may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed.

5.3. Advice for firefighters

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

Special fire fighting procedures
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.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
Evacuate the area promptly. No action shall be taken involving any personal risk or without suitable training. In the event of a leak evacuate all personnel until ventilation can restore oxygen concentrations to safe levels. Keep unnecessary personnel away. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them.

For emergency responders
Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up.

6.2. Environmental precautions
Should not be released into the environment. Prevent further leakage or spillage if safe to do so.

6.3. Methods and material for containment and cleaning up
Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil etc) away from spilled material. Stop leak if you can do so without risk. If possible, turn leaking containers so that gas escapes rather than liquid. Isolate area until gas has dispersed.

6.4. Reference to other sections
For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Do not smoke. All equipment used when handling the product must be grounded. Do not breathe gas. Avoid prolonged exposure. Do not enter storage areas or confined spaces unless adequately ventilated. Use only outdoors or in a well-ventilated area. Oxygen concentration should not fall below 19.5 % at sea level (pO2 = 135 mmHg). Mechanical ventilation or local exhaust ventilation may be required. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities
Do not store, incinerate, or heat this material above 120 degrees Fahrenheit. Keep away from heat, sparks and open flame. This material can accumulate static charge which may cause spark and become an ignition source. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Protect cylinders from damage. Stored containers should be periodically checked for general condition and leakage. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

7.3. Specific end use(s)
Soldering and brazing.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

UK. EH40 Workplace Exposure Limits (WELs)

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butane (CAS 106-97-8)</td>
<td>STEL</td>
<td>1810 mg/m3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>750 ppm</td>
</tr>
</tbody>
</table>
**UK. EH40 Workplace Exposure Limits (WELs)**

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biological limit values</strong></td>
<td>TWA</td>
<td>1450 mg/m3</td>
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<tr>
<td></td>
<td></td>
<td>600 ppm</td>
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<tr>
<td><strong>Recommended monitoring</strong></td>
<td>procedures</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Derived no effect</strong></td>
<td>(DNELs)</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Predicted no effect</strong></td>
<td>concentrations (PNECs)</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Control banding approach</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Appropriate engineering</strong></td>
<td>controls</td>
<td></td>
</tr>
<tr>
<td><strong>Exposure controls</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**8.2. Exposure controls**

- Provide adequate ventilation and minimize the risk of inhalation of gas. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

**Individual protection measures, such as personal protective equipment**

- **General information**: Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.
- **Eye/face protection**: Wear approved safety glasses or goggles. Face shield is recommended.
- **Skin protection**
  - **Hand protection**: Regular work 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**: Contact with liquefied gas might cause frostbites, in some cases with tissue damage. Wear appropriate thermal protective clothing, when necessary.

**Hygiene measures**

- When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

**Environmental exposure controls**

- Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels.

---

**SECTION 9: Physical and chemical properties**

**9.1. Information on basic physical and chemical properties**

- **Appearance**
  - **Physical state**: Gas (Liquefied).
  - **Form**: Compressed liquefied gas.
  - **Colour**: Colourless.
  - **Odour**: Rotten egg.
  - **Odour threshold**: Not available.
  - **pH**: Not applicable.
  - **Melting point/freezing point**: -188 °C (-306.4 °F)
  - **Initial boiling point and boiling range**: -42 °C (-43.6 °F) 14.7 psia
  - **Flash point**: -104.0 °C (-155.2 °F)
  - **Evaporation rate**: Not applicable.
  - **Flammability (solid, gas)**: Extremely flammable gas.
  - **Upper/lower flammability or explosive limits**
    - **Explosive limit - lower (%):** 2.15 %
    - **Explosive limit – upper (%):** 9.6 %
    - **Vapour pressure**: 127 psig (21°C / 70°F)
    - **Vapour density**: Not available.
Relative density
0.504 (liquid)
1.5 (vapour) (air=1) @ 15°C / 60°F

Solubility
Slightly soluble in water.

Auto-ignition temperature
432 °C (809.6 °F)

Partition coefficient
1.77
(n-octanol/water)

Viscosity
Not applicable.

Explosive properties
Not explosive.

Oxidising properties
Not oxidising.

SECTION 10: Stability and reactivity

10.1. Reactivity
Reacts violently with strong oxidants, nitrites, inorganic chlorides, chlorites and perchlorates causing fire and explosion hazard.

10.2. Chemical stability
Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions
Polymerization will not occur. May form explosive mixture with air. This product may react with oxidizing agents.

10.4. Conditions to avoid
Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Protect against direct sunlight. Contact with incompatible materials.

10.5. Incompatible materials

10.6. Hazardous decomposition products
Thermal decomposition of this product can generate carbon monoxide and carbon dioxide. Hydrocarbons.

SECTION 11: Toxicological information

General information
Occupational exposure to the substance or mixture may cause adverse effects.

Information on likely routes of exposure

Inhalation
High concentrations: Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Breathing of high concentrations may cause dizziness, light-headedness, headache, nausea and loss of co-ordination. Continued inhalation may result in unconsciousness.

Skin contact
Contact with liquefied gas may cause frostbite.

Eye contact
Contact with liquefied gas may cause frostbite.

Ingestion
This material is a gas under normal atmospheric conditions and ingestion is unlikely.

Symptoms
Headache. Dizziness. Fatigue. Nausea, vomiting. Very high exposure can cause suffocation from lack of oxygen. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themselves.

11.1. Information on toxicological effects

Acute toxicity
Not expected to be acutely toxic.

Components
Propane (CAS 74-98-6)

Acute
Inhalation
Gas
LC50
Rat
> 80000 ppm, 15 Minutes

Propylene (CAS 115-07-1)

Acute
Inhalation
Gas
LC50
Rat
> 65000 ppm, 4 Hours

Skin corrosion/irritation
Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation
Based on available data, the classification criteria are not met.

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

Skin sensitisation
Based on available data, the classification criteria are not met.
Germ cell mutagenicity: Based on available data, the classification criteria are not met.
Carcinogenicity: Based on available data, the classification criteria are not met.
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: Not likely, due to the form of the product.
Mixture versus substance information: No information available.
Other information: Exposure over a long period of time may cause central nervous system effects.

SECTION 12: Ecological information

12.1. Toxicity: The product is not expected to be hazardous to the environment.
12.2. Persistence and degradability: Not relevant, due to the form of the product.
12.3. Bioaccumulative potential: Not relevant, due to the form of the product.

Partition coefficient:
- n-octanol/water (log Kow): Propylene (CAS 115-07-1) 1.77

Bioconcentration factor (BCF): Not available.
12.4. Mobility in soil: Not relevant, due to the form of the product.
12.5. Results of PBT and vPvB assessment: This mixture does not contain substances assessed to be vPvB / PBT according to Regulation (EC) No 1907/2006, Annex XIII.
12.6. Other adverse effects: The product contains volatile organic compounds which have a photochemical ozone creation potential.

SECTION 13: Disposal considerations

13.1. Waste treatment methods:
- Residual waste: Dispose in accordance with all applicable regulations.
- Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.
- EU waste code: 16 05 04*
  - The waste code should be assigned in discussion between the user, the producer and the waste disposal company. The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Disposal methods/information: Use the container until empty. Do not dispose of any non-empty container. Empty containers have residual vapor that is flammable and explosive. Cylinders should be emptied and returned to a hazardous waste collection point. Do not puncture or incinerate even when empty. Dispose in accordance with all applicable regulations.

Special precautions: Dispose of in accordance with local regulations.

SECTION 14: Transport information

ADR
- 14.1. UN number: UN1978
- 14.2. UN proper shipping name: PROPANE
- 14.3. Transport hazard class(es): Class 2.1
  - Subsidiary risk: -
  - Label(s): 2.1
  - Hazard No. (ADR): 23
  - Tunnel restriction code: B/D
- 14.4. Packing group: -
- 14.5. Environmental hazards: No
- 14.6. Special precautions for user: Read safety instructions, SDS and emergency procedures before handling.

RID
- 14.1. UN number: UN1978
- 14.2. UN proper shipping name: PROPANE
- 14.3. Transport hazard class(es): Class 2.1
Subsidiary risk 2.1 (+13)
14.4. Packing group -
14.5. Environmental hazards No
14.6. Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

ADN
14.1. UN number UN1978
14.2. UN proper shipping name PROPANE
14.3. Transport hazard class(es)
   Class 2.1
   Subsidiary risk -
   Label(s) 2.1
14.4. Packing group -
14.5. Environmental hazards No
14.6. Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IATA
14.1. UN number UN1978
14.2. UN proper shipping name Propane
14.3. Transport hazard class(es)
   Class 2.1
   Subsidiary risk -
14.4. Packing group -
14.5. Environmental hazards No
   ERG Code 10L
14.6. Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IMDG
14.1. UN number UN1978
14.2. UN proper shipping name PROPANE
14.3. Transport hazard class(es)
   Class 2.1
   Subsidiary risk -
14.4. Packing group -
14.5. Environmental hazards No
   Marine pollutant No
   EmS F-D, S-U
14.6. Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information
15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations
  Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended
  Not listed.
  Not listed.
  Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended
  Not listed.
  Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended
  Not listed.
  Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended
  Not listed.
  Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended
  Not listed.
Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA
Not listed.

Authorisations
Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended
Not listed.

Restrictions on use
Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended
Not listed.

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.
Not listed.

Other EU regulations
Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended
Not listed.

The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended.

National regulations
Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work, as amended.
Follow national regulation for work with chemical agents in accordance with Directive 98/24/EC, as amended.

15.2. Chemical safety assessment
No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

ADN: European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways.
ADR: European Agreement Concerning the International Carriage of Dangerous Goods by Road.
IATA: International Air Transport Association.
LC50: Lethal Concentration, 50%.
PBT: Persistent, bioaccumulative, toxic.
RID: Regulations concerning the International Carriage of Dangerous Goods by Rail.
STEL: Short-Term Exposure Limit.
TWA: Time Weighted Average Value.
vPvB: very Persistent, very Bioaccumulative.

References
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
EPA: AQUIRE database
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
National Toxicology Program (NTP) Report on Carcinogens

Information on evaluation method leading to the classification of mixture
The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available.

Full text of any H-statements not written out in full under Sections 2 to 15
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.

Training information
Follow training instructions when handling this material.

Disclaimer
Worthington Cylinder Corporation cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user’s responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.