

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

1.1. Product identifier

| | |
|--|---------------|
| Trade name or designation of the mixture | Propane |
| Registration number | - |
| Synonyms | None. |
| SDS number | WC002 |
| Product code | UN1978 |
| Issue date | 11-April-2014 |
| Version number | 01 |
| Revision date | - |
| Supersedes date | - |

1.2. Relevant identified uses of the substance or mixture and uses advised against

| | |
|----------------------|----------------|
| Identified uses | Portable fuel. |
| 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 5301 United States |
| Contact person | Ann Stiefvater |
| E-mail address | Ann.Stiefvater@worthingtonindustries.com |
| Telephone number | 1-920-849-1740 |
| 1.4. 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 Directive 67/548/EEC or 1999/45/EC as amended

This preparation is classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification F+;R12

The full text for all R-phrases is displayed in section 16.

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

Physical hazards

| | | |
|----------------------|---------------|--|
| Flammable gases | Category 1 | H220 - Extremely flammable gas. |
| Gases under pressure | Liquefied gas | H280 - Contains gas under pressure; may explode if heated. |

Hazard summary

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|------------------------------|--|
| Physical hazards | Extremely flammable. |
| Health hazards | Not classified for health hazards. However, occupational exposure to the mixture or substance(s) may cause adverse health effects. |
| Environmental hazards | Not classified for hazards to the environment. |
| Specific hazards | Extremely flammable. Vapours are heavier than air and may travel along the floor and in the bottom of containers. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. |
| Main symptoms | Exposure to rapidly expanding gas or vapourizing liquid may cause frostbite ("cold burn"). Very high exposure can cause suffocation from lack of oxygen. May cause drowsiness or dizziness. |

2.2. Label elements

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

Hazard pictograms**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/sparks/open flames/hot surfaces. - No smoking.

Response

P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
 P381 - Eliminate all ignition sources if safe to do so.

Storage

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

Disposal

Dispose of waste and residues in accordance with local authority requirements.

Supplemental label information

None.

2.3. Other hazards

Not a PBT or vPvB substance or mixture.

SECTION 3: Composition/information on ingredients**3.2. Mixtures****General information**

| Chemical name | % | CAS-No. / EC No. | REACH Registration No. | INDEX No. | Notes |
|------------------------|--|-----------------------|------------------------|--------------|-------|
| Propane | 87.5-100 | 74-98-6 200-827-9 | - | 601-003-00-5 | |
| Classification: | DSD: F+;R12 | | | | |
| | CLP: Flam. Gas 1;H220, Press. Gas;H280, Press. Gas;H280 | | | | U |
| Ethane | 0-7 | 74-84-0 200-814-8 | - | 601-002-00-X | |
| Classification: | DSD: F+;R12 | | | | |
| | CLP: Flam. Gas 1;H220 | | | | U |
| Propylene | 0-5 | 115-07-1 204-062-1 | - | 601-011-00-9 | |
| Classification: | DSD: F+;R12 | | | | |
| | CLP: Flam. Gas 1;H220, Press. Gas;H280 | | | | U |
| Butane | 0-2.5 | 106-97-8 203-448-7 | - | 601-004-00-0 | |
| Classification: | DSD: F+;R12 | | | | |
| | CLP: Flam. Gas 1;H220, Press. Gas;H280 | | | | C,U |

Additives

| Chemical name | % | CAS-No. / EC No. | REACH Registration No. | INDEX No. | Notes |
|-----------------|--------|----------------------|------------------------|--------------|-------|
| Ethyl mercaptan | <0.005 | 75-08-1 200-837-3 | - | 016-022-00-9 | |

DSD: Directive 67/548/EEC.

CLP: Regulation No. 1272/2008.

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.

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.

Composition comments

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The full text for all R- and H-phrases is displayed in section 16.

SECTION 4: First aid measures

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| 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 | 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 | Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if irritation develops and persists. If frostbite occurs, immerse involved area in warm water (between 100 F/38 C and 110 F/43 C, not exceeding 112 F/44 C). Keep immersed for 20 to 40 minutes. Seek medical assistance. |
| 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. |
| 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. May cause drowsiness or dizziness. |
| 4.3. Indication of any immediate medical attention and special treatment needed | Exposure may aggravate pre-existing respiratory disorders. Treat symptomatically. |

SECTION 5: Firefighting measures

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| General fire hazards | Extremely flammable gas. |
| 5.1. Extinguishing media | |
| Suitable extinguishing media | Dry chemical, CO ₂ , water spray, fog, or foam. |
| Unsuitable extinguishing media | None known. |
| 5.2. Special hazards arising from the substance or mixture | Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. |
| 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. Use standard firefighting procedures and consider the hazards of other involved materials. |
| Special fire fighting procedures | 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. |

SECTION 6: Accidental release measures

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| 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. Keep unnecessary personnel away. Ensure adequate ventilation. In case of inadequate ventilation, use respiratory protection. Wear appropriate personal protective equipment (See Section 8). |
| For emergency responders | Keep unnecessary personnel away. Use personal protection recommended in section 8 of the SDS. |
| 6.2. 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. |
| 6.3. Methods and material for containment and cleaning up | Ventilate well, stop flow of gas or liquid if possible. Immediately contact emergency personnel. |
| 6.4. Reference to other sections | For personal protection, see section 8. For waste disposal, see section 13. |

SECTION 7: Handling and storage

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| 7.1. Precautions for safe handling | Eliminate all sources of ignition. 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. |
|---|---|

7.2. 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.

7.3. Specific end use(s)

Fuel.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

UK. EH40 Workplace Exposure Limits (WELs)

| Components | Type | Value |
|-------------------------------|------|------------------------|
| Butane (CAS 106-97-8) | STEL | 1810 mg/m ³ |
| | | 750 ppm |
| | TWA | 1450 mg/m ³ |
| | | 600 ppm |
| Additives | Type | Value |
| Ethyl mercaptan (CAS 75-08-1) | STEL | 5.2 mg/m ³ |
| | | 2 ppm |
| | TWA | 1.3 mg/m ³ |
| | | 0.5 ppm |

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

Recommended monitoring procedures Follow standard monitoring procedures.

Derived no-effect level (DNEL) Not available.

Predicted no effect concentrations (PNECs) Not available.

8.2. Exposure controls

Appropriate engineering 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 protective 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.

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 Contact with liquefied gas might cause frostbites, in some cases with tissue damage. Wear appropriate thermal protective clothing, when necessary.

Hygiene measures 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.

Environmental exposure controls Environmental manager must be informed of all major releases.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

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|-------------------------------------|---------------------------|
| Appearance | Colorless gas. |
| Physical state | Gas. |
| 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 (vapor) (air=1) @ 15°C / 60°F |
| Solubility(ies) | Slightly soluble in water. |
| Partition coefficient (n-octanol/water) | 1.77 |
| Auto-ignition temperature | 432 °C (809.6 °F) |
| Decomposition temperature | Not available. |
| Viscosity | Not applicable. |
| Explosive properties | Not available. |
| Oxidizing properties | Not available. |
| 9.2. Other information | |
| Molecular weight | 45 g/mol |
| Percent volatile | 100 % |

SECTION 10: Stability and reactivity

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|---|---|
| 10.1. Reactivity | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| 10.2. Chemical stability | Stable under normal temperature conditions and recommended use. |
| 10.3. Possibility of hazardous reactions | Polymerization will not occur. |
| 10.4. Conditions to avoid | Heat, flames and sparks. |
| 10.5. Incompatible materials | Strong oxidising agents. Strong acids. Halogens. |
| 10.6. Hazardous decomposition products | Carbon oxides. Hydrocarbons. |

SECTION 11: Toxicological information

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

Information on likely routes of exposure

| | |
|---------------------|---|
| Ingestion | Not likely, due to the form of the product. |
| 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. |

Symptoms Exposure to rapidly expanding gas or vapourizing liquid may cause frostbite ("cold burn"). Very high exposure can cause suffocation from lack of oxygen. May cause drowsiness or dizziness.

11.1. Information on toxicological effects

Acute toxicity High concentration: Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels.

Toxicological data

| Additives | Species | Test results |
|-------------------------------|---------|--------------|
| Ethyl mercaptan (CAS 75-08-1) | | |
| Acute | | |
| <i>Dermal</i> | | |
| LD50 | Rat | > 2000 mg/kg |

| Additives | Species | Test results |
|---|--|--------------------|
| <i>Inhalation</i> LC50 | Mouse | 4420 mg/l, 4 Hours |
| <i>Oral</i> LD50 | Rat | 682 mg/kg |
| 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 sensitisation | Not classified. | |
| Skin sensitisation | Not classified. | |
| Germ cell mutagenicity | Not classified. | |
| Carcinogenicity | Not classified. | |
| Reproductive toxicity | Not classified. | |
| Specific target organ toxicity - single exposure | Not classified. | |
| Specific target organ toxicity - repeated exposure | Not classified. | |
| Aspiration hazard | Not classified. | |
| Mixture versus substance information | Not available. | |
| Other information | Not available. | |

SECTION 12: Ecological information

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|---|--|
| 12.1. Toxicity | Not expected to be harmful to aquatic organisms. |
| 12.2. Persistence and degradability | The product is readily biodegradable. |
| 12.3. Bioaccumulative potential | The product is not expected to bioaccumulate. |
| Partition coefficient n-octanol/water (log Kow) Propane (CAS Mixture) | 1.77 |
| Bioconcentration factor (BCF) | Not available. |
| 12.4. Mobility in soil | May evaporate quickly. |
| 12.5. Results of PBT and vPvB assessment | Not a PBT or vPvB substance or mixture. |
| 12.6. Other adverse effects | None known. |

SECTION 13: Disposal considerations

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|--------------------------------------|---|
| 13.1. Waste treatment methods | |
| Residual waste | Dispose in accordance with all applicable regulations. |
| Contaminated packaging | Since emptied containers may retain product residue, follow label warnings even after container is emptied. |
| EU waste code | 16 05 04* 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. |

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 Not applicable.
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 -
Label(s) 2.1 (+13)
14.4. Packing group Not applicable.
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 Not applicable.
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 -
Label(s) 2.1
14.4. Packing group Not applicable.
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 -
Label(s) 2.1
14.4. Packing group Not applicable.
14.5. Environmental hazards
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 This product is a compressed or liquefied gas and when transported in bulk is covered under IGC code.

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

Not listed.

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex II

Not listed.

Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(1) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorisation, 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

Ethyl mercaptan (CAS 75-08-1)

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work

Not listed.

Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breastfeeding

Not listed.

Other EU regulations

Directive 96/82/EC (Seveso II) on the control of major-accident hazards involving dangerous substances

Not listed.

Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Ethyl mercaptan (CAS 75-08-1)

Directive 94/33/EC on the protection of young people at work

Not listed.

Other regulations

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

National regulations

Follow national regulation for work with chemical agents.
Young people under 18 years old are not allowed to work with this product according to the EU Directive 94/33/EC on the protection of young people at work.

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

CLP: Regulation No. 1272/2008.
DSD: Directive 67/548/EEC.

References

Not available.

Information on evaluation method leading to the classification of mixture

The substance is classified based on test data for physical hazards. The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available. For details, refer to Sections 9, 11 and 12.

Full text of any statements or R-phrases and H-statements under Sections 2 to 15

R12 Extremely flammable.

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

Training information

Follow training instructions when handling this material.

Disclaimer

All information in this Material Safety Data Sheet is believed to be accurate and reliable. However, no guarantee or warranty of any kind is made with regard to the accuracy of information or the suitability of the recommendations contained herein. It is the user's responsibility to assess the safety and toxicity of this product under their own conditions of use and to comply with all applicable laws and regulations.