SAFETY DATA SHEET

WORTHINGTON INDUSTRIES

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

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, 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.

P381	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

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:	Flam. Gas 1;H220, Press. Gas;H280				U
Propylene	0 - 10	115-07-1 204-062-1	-	601-011-00-9	
Classification:	Flam. Gas 1;H220, Press. Gas;H280				U
Ethane	0 - 7	74-84-0 200-814-8	-	601-002-00-X	
Classification:	Flam. Gas 1;H220, Press. Gas;H280				U
Butane	0 - 2.5	106-97-8 203-448-7	-	601-004-01-8	
Classification:	Flam. Gas 1;H220, Press. Gas;H280				C,U

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 themself.

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.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials. Cool containers exposed to flames with water until well after the fire is out.

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 original tightly closed container. 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)

Components	Type	Value
Butane (CAS 106-97-8)	STEL	1810 mg/m3
		750 ppm

UK. EH40 Workplace Exposure Limits (WELs)

Components	Type	Value
	TWA	1450 mg/m3
		600 ppm

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

Recommended monitoring procedures Follow standard monitoring procedures.

Derived no effect levels (DNELs) Not available.

Predicted no effect concentrations (PNECs) Not available.

Control banding approach Follow standard monitoring procedures.

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 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(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 explosive.
Oxidising properties	Not oxidising.

9.2. Other information

Molecular weight	45 g/mol
Percent volatile	100 %

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	Strong oxidising agents. Halogens. Nitrates.
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 themself.

11.1. Information on toxicological effects

Acute toxicity Not expected to be acutely toxic.

Components	Species	Test Results
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	-
Label(s)	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	
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.

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

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.

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

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.

Other regulations	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.
IBC Code: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.
IMDG Code: International Maritime Dangerous Goods Code.
LC50: Lethal Concentration, 50%.
MARPOL: International Convention for the Prevention of Pollution from Ships.
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.