

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

1.1. Product identifier

Product form : Mixture
Product name : 13 Components in 1,3-Butadiene
Product code : SG-2014-02522

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

Use of the substance/mixture : Test gas/Calibration gas.

1.3. Details of the supplier of the safety data sheet

Air Liquide
2700 Post Oak Boulevard
Houston, TX 77056 - USA
T 1-800-819-1704
www.us.airliquide.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Flam. Gas 1	H220
Liquefied gas	H280
Muta. 1B	H340
Carc. 1A	H350

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US)



Signal word (GHS-US)

: Danger

Hazard statements (GHS-US)

: H220 - Extremely flammable gas
H280 - Contains gas under pressure; may explode if heated
H340 - May cause genetic defects (Inhalation)
H350 - May cause cancer
OSHA-H01 - May displace oxygen and cause rapid suffocation
CGA-HG01 - May cause frostbite
CGA-HG04 - May form explosive mixtures with air

Precautionary statements (GHS-US)

: P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear eye protection, face protection, protective gloves, protective clothing
P302 - IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area, Get immediate medical advice/attention
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P308+P313 - If exposed or concerned: Get medical advice/attention
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely
P381 - Eliminate all ignition sources if safe to do so
P403 - Store in a well-ventilated place
P405 - Store locked up
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

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CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG06 - Close valve after each use and when empty
CGA-PG10 - Use only with equipment rated for cylinder pressure
CGA-PG14 - Approach suspected leak area with caution
CGA-PG21 - Open valve slowly

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	GHS-US classification
1,3-Butadiene	(CAS No) 106-99-0	88.8002 - 99.99987	Flam. Gas 1, H220 Liquefied gas, H280 Muta. 1B, H340 Carc. 1A, H350
Propadiene 1,2	(CAS No) 463-49-0	0.00001 - 1	Flam. Gas 1, H220 Liquefied gas, H280
Methyl acetylene	(CAS No) 74-99-7	0.00001 - 1	Flam. Gas 1, H220 Liquefied gas, H280
Ethyl acetylene	(CAS No) 107-00-6	0.00001 - 1	Flam. Gas 1, H220 Liquefied gas, H280
1-Butene	(CAS No) 106-98-9	0.00001 - 1	Flam. Gas 1, H220 Liquefied gas, H280
Butadiene 1,2-	(CAS No) 590-19-2	0.00001 - 1	Flam. Gas 1, H220 Liquefied gas, H280
cis-2-Butene	(CAS No) 590-18-1	0.00001 - 1	Flam. Gas 1, H220 Liquefied gas, H280
Isobutylene	(CAS No) 115-11-7	0.00001 - 1	Flam. Gas 1, H220 Liquefied gas, H280
Isoprene	(CAS No) 78-79-5	0.00001 - 1	Flam. Liq. 1, H224 Muta. 2, H341 Carc. 1B, H350 Aquatic Chronic 2, H411
n-Pentane	(CAS No) 109-66-0	0.00001 - 1	Flam. Liq. 2, H225 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411
trans-2-Butene	(CAS No) 624-64-6	0.00001 - 1	Flam. Gas 1, H220 Liquefied gas, H280
VINYL ACETYLENE	(CAS No) 689-97-4	0.00001 - 1	Flam. Gas 1, H220 Compressed gas, H280
4-VINYL,1-CYCLOHEXENE	(CAS No) 100-40-3	0.00001 - 0.0999	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Carc. 2, H351 Repr. 2, H361 Asp. Tox. 1, H304
2-Methylbutane	(CAS No) 78-78-4	0.00001 - 0.0999	Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.
- First-aid measures after skin contact : Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.
- First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.
- First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

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4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation	: May displace oxygen and cause rapid suffocation.
Symptoms/injuries after skin contact	: May cause frostbite.
Symptoms/injuries after eye contact	: Contact with the product may cause cold burns or frostbite.
Symptoms/injuries after ingestion	: Ingestion is not considered a potential route of exposure.
Symptoms/injuries upon intravenous administration	: Not known.
Chronic symptoms	: May cause cancer. May cause genetic defects.

4.3. Indication of any immediate medical attention and special treatment needed

If you feel unwell, seek medical advice. If breathing is difficult, give oxygen.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Use extinguishing media appropriate for surrounding fire.
Unsuitable extinguishing media	: Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

Fire hazard	: This product is flammable.
Explosion hazard	: Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries. May form flammable/explosive vapor-air mixture.
Reactivity	: None known.

5.3. Advice for firefighters

Firefighting instructions	: In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.
Protection during firefighting	: Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	: Ensure adequate ventilation.
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6.1.1. For non-emergency personnel

Protective equipment	: Wear protective equipment consistent with the site emergency plan.
Emergency procedures	: Escape the danger area by the closest safe route. Close doors and windows of adjacent premises. Keep containers closed. Mark the danger area. Seal off low-lying areas. Keep upwind.

6.1.2. For emergency responders

Protective equipment	: Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Equip cleanup crew with proper protection.
Emergency procedures	: Evacuate and limit access. Ventilate area. Remove ignition sources. Monitor concentration of released product. Consider the risk of potentially explosive atmospheres. Wear self-contained breathing apparatus when entering atmospheres of unknown contaminant concentration until proven to be safe.

6.2. Environmental precautions

Try to stop release if safe to do so.

6.3. Methods and material for containment and cleaning up

For containment	: Try to stop release if safe to do so.
Methods for cleaning up	: Dispose of this material and its container in accordance with local regulations.

6.4. Reference to other sections

See also Sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed	: Pressurized container: Do not pierce or burn, even after use. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Handle empty containers with care because residual vapors are flammable. In use, may form flammable vapor-air mixture.
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Precautions for safe handling	: Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Use only non-sparking tools.
Hygiene measures	: Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures	: Comply with applicable regulations. Proper grounding procedures to avoid static electricity should be followed.
Storage conditions	: Do not expose to temperatures exceeding 52°C (125°F). Keep container closed when not in use. Protect cylinder from physical damage. Store in well ventilated area. Store locked up.
Incompatible products	: None known.
Incompatible materials	: Oxidizing materials. Air.

7.3. Specific end use(s)

See Section 1.2.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

13 Components in 1,3-Butadiene		
ACGIH	Not applicable	
OSHA	Not applicable	
Butadiene 1,2- (590-19-2)		
ACGIH	Not applicable	
OSHA	Not applicable	
1-Butene (106-98-9)		
ACGIH	ACGIH TWA (ppm)	250 ppm
OSHA	Not applicable	
cis-2-Butene (590-18-1)		
ACGIH	ACGIH TWA (ppm)	250 ppm
OSHA	Not applicable	
Ethyl acetylene (107-00-6)		
ACGIH	Not applicable	
OSHA	Not applicable	
Isobutylene (115-11-7)		
ACGIH	ACGIH TWA (ppm)	250 ppm
OSHA	Not applicable	
2-Methylbutane (78-78-4)		
ACGIH	ACGIH TWA (ppm)	600 ppm
OSHA	Not applicable	
Isoprene (78-79-5)		
ACGIH	Not applicable	
OSHA	Not applicable	
Methyl acetylene (74-99-7)		
ACGIH	ACGIH TWA (ppm)	1000 ppm
OSHA	OSHA PEL (TWA) (mg/m³)	1650 mg/m³
OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
n-Pentane (109-66-0)		
ACGIH	ACGIH TWA (ppm)	600 ppm
OSHA	OSHA PEL (TWA) (mg/m³)	2950 mg/m³

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n-Pentane (109-66-0)		
OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
Propadiene 1,2 (463-49-0)		
ACGIH	Not applicable	
OSHA	Not applicable	
trans-2-Butene (624-64-6)		
ACGIH	ACGIH TWA (ppm)	250 ppm
OSHA	Not applicable	
4-VINYL,1-CYCLOHEXENE (100-40-3)		
ACGIH	Not applicable	
OSHA	Not applicable	
VINYL ACETYLENE (689-97-4)		
ACGIH	Not applicable	
OSHA	Not applicable	
1,3-Butadiene (106-99-0)		
ACGIH	ACGIH TWA (ppm)	2 ppm
OSHA	OSHA PEL (TWA) (ppm)	1 ppm
OSHA	OSHA PEL (STEL) (ppm)	5 ppm (see 29 CFR 1910.1051)

8.2. Exposure controls

Appropriate engineering controls	: Ensure exposure is below occupational exposure limits. Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Oxygen detectors should be used when asphyxiating gases may be released. Consider work permit system e.g. for maintenance activities.
Hand protection	: Wear working gloves when handling gas containers. 29 CFR 1910.138: Hand Protection.
Eye protection	: Wear safety glasses with side shields. 29 CFR 1910.133: Eye and Face Protection.
Skin and body protection	: Wear suitable protective clothing, e.g. - lab coats, coveralls or flame resistant clothing.
Respiratory protection	: None necessary during normal and routine operations. See Sections 5 & 6.
Thermal hazard protection	: None necessary during normal and routine operations.
Environmental exposure controls	: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.
Other information	: Wear safety shoes while handling containers. 29 CFR 1910.136: Foot Protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Clear, colorless gas.
Color	: Colorless
Odor	: No data available
Odor threshold	: No data available
pH	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: See Section 2.1 and 2.2
Explosion limits	: No data available
Explosive properties	: Without adequate ventilation formation of explosive mixtures may be possible.
Oxidizing properties	: None.

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Vapor pressure	: No data available
Relative density	: No data available
Relative vapor density at 20 °C	: No data available
Molecular mass	: No Data Available
Relative gas density	: Heavier than air
Solubility	: No data available
Log Pow	: No data available
Log Kow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available

9.2. Other information

Additional information	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
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SECTION 10: Stability and reactivity

10.1. Reactivity

None known.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Can form explosive mixture with air.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Oxidizing materials. Air.

10.6. Hazardous decomposition products

Under normal conditions of storage and use hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: Not classified
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Butadiene 1,2- (590-19-2)	
LC50 inhalation rat (ppm)	110000 ppm/4h
ATE US (gases)	110000.000 ppmV/4h
1-Butene (106-98-9)	
LC50 inhalation rat (ppm)	500000 ppm/4h
cis-2-Butene (590-18-1)	
LC50 inhalation rat (ppm)	150307.38 ppm/4h
Isobutylene (115-11-7)	
LC50 inhalation rat (mg/l)	620 mg/l/4h
LC50 inhalation rat (ppm)	239620.46 ppm/4h
ATE US (gases)	239620.460 ppmV/4h
ATE US (vapors)	620.000 mg/l/4h
ATE US (dust, mist)	620.000 mg/l/4h
2-Methylbutane (78-78-4)	
LC50 inhalation rat (ppm)	94859.36 ppm/4h

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Isoprene (78-79-5)	
LD50 dermal rat	> 1 ml/kg
LC50 inhalation rat (mg/l)	180 mg/l/4h
LC50 inhalation rat (ppm)	64597.09 ppm/4h
ATE US (gases)	64597.090 ppmV/4h
ATE US (vapors)	180.000 mg/l/4h
ATE US (dust, mist)	180.000 mg/l/4h

Methyl acetylene (74-99-7)	
LC50 inhalation rat (ppm)	51429 ppm/4h
ATE US (gases)	51429.000 ppmV/4h

n-Pentane (109-66-0)	
LD50 dermal rabbit	3000 mg/kg
LC50 inhalation rat (mg/l)	364 g/m³ (Exposure time: 4 h)
LC50 inhalation rat (ppm)	123317.17 ppm/4h
ATE US (dermal)	3000.000 mg/kg body weight
ATE US (gases)	123317.170 ppmV/4h
ATE US (vapors)	364.000 mg/l/4h
ATE US (dust, mist)	364.000 mg/l/4h

trans-2-Butene (624-64-6)	
LC50 inhalation rat (ppm)	150307.38 ppm/4h

1,3-Butadiene (106-99-0)	
LD50 oral rat	5480 mg/kg
LC50 inhalation rat (mg/l)	285 g/m³ (Exposure time: 4 h)
LC50 inhalation rat (ppm)	110000 ppm/4h

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: May cause genetic defects (Inhalation).
Carcinogenicity	: May cause cancer.

Isobutylene (115-11-7)	
National Toxicology Program (NTP) Status	1 - Evidence of Carcinogenicity

Isoprene (78-79-5)	
IARC group	2B - Possibly carcinogenic to humans
National Toxicology Program (NTP) Status	1 - Evidence of Carcinogenicity, 3 - Reasonably anticipated to be Human Carcinogen
In OSHA Hazard Communication Carcinogen list	Yes

1,3-Butadiene (106-99-0)	
IARC group	1 - Carcinogenic to humans
National Toxicology Program (NTP) Status	1 - Evidence of Carcinogenicity, 2 - Known Human Carcinogens
In OSHA Hazard Communication Carcinogen list	Yes
In OSHA Specifically Regulated Carcinogen list	Yes

Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified

Specific target organ toxicity (repeated exposure)	: Not classified
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Aspiration hazard	: Not classified
Symptoms/injuries after inhalation	: May displace oxygen and cause rapid suffocation.
Symptoms/injuries after skin contact	: May cause frostbite.
Symptoms/injuries after eye contact	: Contact with the product may cause cold burns or frostbite.
Symptoms/injuries after ingestion	: Ingestion is not considered a potential route of exposure.
Symptoms/injuries upon intravenous administration	: Not known.
Chronic symptoms	: May cause cancer. May cause genetic defects.

SECTION 12: Ecological information

12.1. Toxicity

2-Methylbutane (78-78-4)	
EC50 Daphnia 1	2.3 mg/l (Exposure time: 48 h - Species: Daphnia magna)
Isoprene (78-79-5)	
LC50 fish 1	32.5 - 50.15 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])
EC50 Daphnia 1	140 mg/l (Exposure time: 48 h - Species: Daphnia magna)
EC50 other aquatic organisms 1	> 1000 mg/l (Exposure time: 96 h - Species: Scenedesmus quadricauda)
LC50 fish 2	58.75 - 95.32 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
n-Pentane (109-66-0)	
LC50 fish 1	9.87 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)
EC50 Daphnia 1	9.74 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	11.59 mg/l (Exposure time: 96 h - Species: Pimephales promelas)

12.2. Persistence and degradability

Butadiene 1,2- (590-19-2)	
Persistence and degradability	The substance is biodegradable. Unlikely to persist.
1-Butene (106-98-9)	
Persistence and degradability	Not readily biodegradable.
cis-2-Butene (590-18-1)	
Persistence and degradability	No data available.
Ethyl acetylene (107-00-6)	
Persistence and degradability	No data available.
Isobutylene (115-11-7)	
Persistence and degradability	The substance is biodegradable. Unlikely to persist.
2-Methylbutane (78-78-4)	
Persistence and degradability	No data available.
Methyl acetylene (74-99-7)	
Persistence and degradability	No data available.
Propadiene 1,2 (463-49-0)	
Persistence and degradability	No data available.
trans-2-Butene (624-64-6)	
Persistence and degradability	No data available.
1,3-Butadiene (106-99-0)	
Persistence and degradability	Not readily biodegradable.

12.3. Bioaccumulative potential

Butadiene 1,2- (590-19-2)	
Log Pow	1.99
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

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1-Butene (106-98-9)	
Log Pow	2.4
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.
cis-2-Butene (590-18-1)	
Log Pow	2.33
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.
Ethyl acetylene (107-00-6)	
Log Pow	1.46
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.
Isobutylene (115-11-7)	
Log Pow	2.35
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.
2-Methylbutane (78-78-4)	
Log Pow	3.2 - 3.3
Log Kow	Not applicable for gas-mixtures.
Bioaccumulative potential	No data available.
Isoprene (78-79-5)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	3.2 - 4.5 (at 20 °C)
Methyl acetylene (74-99-7)	
Log Pow	0.94
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.
n-Pentane (109-66-0)	
Log Pow	3.39
Propadiene 1,2 (463-49-0)	
Log Pow	1.45
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.
trans-2-Butene (624-64-6)	
Log Pow	2.32
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.
1,3-Butadiene (106-99-0)	
BCF fish 1	13 - 19.1
Log Pow	1.99
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

Butadiene 1,2- (590-19-2)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
1-Butene (106-98-9)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
cis-2-Butene (590-18-1)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
Ethyl acetylene (107-00-6)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
Isobutylene (115-11-7)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
2-Methylbutane (78-78-4)	
Mobility in soil	No data available.
Methyl acetylene (74-99-7)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

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Propadiene 1,2 (463-49-0)

Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
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trans-2-Butene (624-64-6)

Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
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1,3-Butadiene (106-99-0)

Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
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12.5. Other adverse effects

Effect on ozone layer	: No known effects from this product.
Effect on the global warming	: No known ecological damage caused by this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods	: Contact supplier if guidance is required. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded. Waste gas should be flared through a suitable burner with flash back arrestor. Do not discharge into areas where there is a risk of forming an explosive mixture with air.
Waste disposal recommendations	: Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at www.cganet.com for more guidance on suitable disposal methods.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description	: UN3161 Liquefied gas, flammable, n.o.s.
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UN-No.(DOT)	: UN3161
Proper Shipping Name (DOT)	: Liquefied gas, flammable, n.o.s.
Hazard labels (DOT)	: 2.1 - Flammable gas



DOT Packaging Non Bulk (49 CFR 173.xxx)	: 304
DOT Packaging Bulk (49 CFR 173.xxx)	: 314;315
DOT Symbols	: G - Identifies PSN requiring a technical name
DOT Special Provisions (49 CFR 172.102)	: T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter.
DOT Packaging Exceptions (49 CFR 173.xxx)	: 306
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: Forbidden
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 150 kg
DOT Vessel Stowage Location	: D - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.
DOT Vessel Stowage Other	: 40 - Stow "clear of living quarters"

Additional information

Other information	: No supplementary information available.
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ADR

Transport document description	: UN 3161, 2, (B/D)
Class (ADR)	: 2 - Gases

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Hazard identification number (Kemler No.) : 23
Classification code (ADR) : 2F
Orange plates :



Tunnel restriction code (ADR) : B/D
Limited quantities (ADR) : 0
Excepted quantities (ADR) : E0

Transport by sea

UN-No. (IMDG) : 3161
Proper Shipping Name (IMDG) : LIQUEFIED GAS, FLAMMABLE, N.O.S.
Class (IMDG) : 2 - Gases

Air transport

UN-No. (IATA) : 3161
Proper Shipping Name (IATA) : LIQUEFIED GAS, FLAMMABLE, N.O.S.
Class (IATA) : 2

SECTION 15: Regulatory information

15.1. US Federal regulations

Butadiene 1,2- (590-19-2)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
1-Butene (106-98-9)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
cis-2-Butene (590-18-1)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
Ethyl acetylene (107-00-6)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
Isobutylene (115-11-7)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
2-Methylbutane (78-78-4)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
Isoprene (78-79-5)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
Subject to reporting requirements of United States SARA Section 313		
SARA Section 313 - Emission Reporting	0.1 %	
Methyl acetylene (74-99-7)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
n-Pentane (109-66-0)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA.	
Propadiene 1,2 (463-49-0)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
trans-2-Butene (624-64-6)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
1,3-Butadiene (106-99-0)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
Subject to reporting requirements of United States SARA Section 313		
SARA Section 313 - Emission Reporting	0.1 %	

15.2. International regulations

CANADA

13 Components in 1,3-Butadiene

Safety Data Sheet

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Butadiene 1,2- (590-19-2)

Listed on the Canadian DSL (Domestic Substances List)

1-Butene (106-98-9)

Listed on the Canadian DSL (Domestic Substances List)

cis-2-Butene (590-18-1)

Listed on the Canadian DSL (Domestic Substances List)

Ethyl acetylene (107-00-6)

Listed on the Canadian DSL (Domestic Substances List)

Isobutylene (115-11-7)

Listed on the Canadian DSL (Domestic Substances List)

2-Methylbutane (78-78-4)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification

Class B Division 2 - Flammable Liquid

Isoprene (78-79-5)

Listed on the Canadian DSL (Domestic Substances List)

Methyl acetylene (74-99-7)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification

Class A - Compressed Gas
Class B Division 1 - Flammable Gas

n-Pentane (109-66-0)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification

Class B Division 2 - Flammable Liquid

Propadiene 1,2 (463-49-0)

Listed on the Canadian DSL (Domestic Substances List)

trans-2-Butene (624-64-6)

Listed on the Canadian DSL (Domestic Substances List)

1,3-Butadiene (106-99-0)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification

Class A - Compressed Gas
Class B Division 1 - Flammable Gas
Class D Division 2 Subdivision A - Very toxic material causing other toxic effects
Class F - Dangerously Reactive Material

EU-Regulations

Butadiene 1,2- (590-19-2)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

1-Butene (106-98-9)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

cis-2-Butene (590-18-1)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Ethyl acetylene (107-00-6)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Isobutylene (115-11-7)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

2-Methylbutane (78-78-4)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Isoprene (78-79-5)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Methyl acetylene (74-99-7)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

n-Pentane (109-66-0)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

13 Components in 1,3-Butadiene

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Propadiene 1,2 (463-49-0)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

trans-2-Butene (624-64-6)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

1,3-Butadiene (106-99-0)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Not classified

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

No additional information available

National regulations

Butadiene 1,2- (590-19-2)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

1-Butene (106-98-9)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

cis-2-Butene (590-18-1)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

Ethyl acetylene (107-00-6)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

Isobutylene (115-11-7)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

2-Methylbutane (78-78-4)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

13 Components in 1,3-Butadiene

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Isoprene (78-79-5)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Japanese Pollutant Release and Transfer Register Law (PRTR Law)
Listed on the Canadian IDL (Ingredient Disclosure List)

Methyl acetylene (74-99-7)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Canadian IDL (Ingredient Disclosure List)

n-Pentane (109-66-0)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Canadian IDL (Ingredient Disclosure List)

Propadiene 1,2 (463-49-0)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

trans-2-Butene (624-64-6)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

1,3-Butadiene (106-99-0)

Listed on IARC (International Agency for Research on Cancer)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Japanese Pollutant Release and Transfer Register Law (PRTR Law)
Listed as carcinogen on NTP (National Toxicology Program)
Listed on the Canadian IDL (Ingredient Disclosure List)

15.3. US State regulations

Isoprene (78-79-5)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significant risk level (NSRL)
Yes	No	No	No	

13 Components in 1,3-Butadiene

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1,3-Butadiene (106-99-0)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significant risk level (NSRL)
Yes	Yes	Yes	No	0.4 µg/day
1-Butene (106-98-9)				
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List				
cis-2-Butene (590-18-1)				
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List				
Ethyl acetylene (107-00-6)				
U.S. - New Jersey - Right to Know Hazardous Substance List				
Isobutylene (115-11-7)				
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List				
2-Methylbutane (78-78-4)				
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List				
Isoprene (78-79-5)				
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List				
Methyl acetylene (74-99-7)				
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List				
n-Pentane (109-66-0)				
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List				
Propadiene 1,2 (463-49-0)				
U.S. - New Jersey - Right to Know Hazardous Substance List				
trans-2-Butene (624-64-6)				
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List				
1,3-Butadiene (106-99-0)				
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances U.S. - Pennsylvania - RTK (Right to Know) List				

SECTION 16: Other information

Indication of changes

: Revised safety data sheet in accordance with OSHA final rule on GHS implementation promulgated March 26, 2012.

13 Components in 1,3-Butadiene

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Other information

: This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product.

Full text of H-phrases:

Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 1A	Carcinogenicity Category 1A
Carc. 1B	Carcinogenicity Category 1B
Carc. 2	Carcinogenicity Category 2
Compressed gas	Gases under pressure Compressed gas
Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Flam. Gas 1	Flammable gases Category 1
Flam. Liq. 1	Flammable liquids Category 1
Flam. Liq. 2	Flammable liquids Category 2
Liquefied gas	Gases under pressure Liquefied gas
Muta. 1B	Germ cell mutagenicity Category 1B
Muta. 2	Germ cell mutagenicity Category 2
Repr. 2	Reproductive toxicity Category 2
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H220	Extremely flammable gas
H224	Extremely flammable liquid and vapor
H225	Highly flammable liquid and vapor
H280	Contains gas under pressure; may explode if heated
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H319	Causes serious eye irritation
H336	May cause drowsiness or dizziness
H340	May cause genetic defects (Inhalation)
H341	Suspected of causing genetic defects
H350	May cause cancer
H351	Suspected of causing cancer
H361	Suspected of damaging fertility or the unborn child
H411	Toxic to aquatic life with long lasting effects

SDS US (GHS HazCom 2012)

This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.