

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

1.1. Product identifier

Product form : Mixture
 Product name : 9 Components in Ethane
 Product code : SG-2010-00593

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

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS02

GHS04

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

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

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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 |
|----------------|--------------------|--------------------|--|
| Ethane | (CAS No) 74-84-0 | 32.0004 - 99.99991 | Flam. Gas 1, H220 Liquefied gas, H280 |
| n-Butane | (CAS No) 106-97-8 | 0.00001 - 10 | Flam. Gas 1, H220 Liquefied gas, H280 |
| Propane | (CAS No) 74-98-6 | 0.00001 - 10 | Flam. Gas 1, H220 Liquefied gas, H280 |
| Isobutane | (CAS No) 75-28-5 | 0.00001 - 10 | Flam. Gas 1, H220 Liquefied gas, H280 |
| Methane | (CAS No) 74-82-8 | 0.00001 - 10 | Flam. Gas 1, H220 Compressed gas, H280 |
| n-Pentane | (CAS No) 109-66-0 | 0.00001 - 9.8936 | Flam. Liq. 2, H225 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411 |
| 2-Methylbutane | (CAS No) 78-78-4 | 0.00001 - 9.8936 | Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411 |
| Nitrogen | (CAS No) 7727-37-9 | 0.00001 - 5 | Compressed gas, H280 |
| Carbon dioxide | (CAS No) 124-38-9 | 0.00001 - 2.9999 | Liquefied gas, H280 |
| Hexanes Plus | (CAS No) A-176 | 0.00001 - 0.2125 | Flam. Liq. 2, H225 Skin Irrit. 2, H315 Repr. 2, H361 STOT SE 3, H336 STOT RE 2, H373 |

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.

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 : Adverse effects not expected from this product.

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.

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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.

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.
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.
Incompatible products : None known.
Incompatible materials : Oxidizing materials. Air.

7.3. Specific end use(s)

See Section 1.2.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

| 9 Components in Ethane | | |
|---------------------------|-------------------------------------|------------------------|
| ACGIH | Not applicable | |
| OSHA | Not applicable | |
| Carbon dioxide (124-38-9) | | |
| ACGIH | ACGIH TWA (ppm) | 5000 ppm |
| ACGIH | ACGIH STEL (ppm) | 30000 ppm |
| OSHA | OSHA PEL (TWA) (mg/m ³) | 9000 mg/m ³ |
| OSHA | OSHA PEL (TWA) (ppm) | 5000 ppm |
| Ethane (74-84-0) | | |
| ACGIH | ACGIH TWA (ppm) | 1000 ppm |
| OSHA | Not applicable | |
| Nitrogen (7727-37-9) | | |
| ACGIH | Not applicable | |
| OSHA | Not applicable | |
| Hexanes Plus (A-176) | | |
| ACGIH | Not applicable | |
| OSHA | Not applicable | |
| n-Butane (106-97-8) | | |
| ACGIH | ACGIH STEL (ppm) | 1000 ppm |
| OSHA | Not applicable | |
| Isobutane (75-28-5) | | |
| ACGIH | ACGIH STEL (ppm) | 1000 ppm |
| OSHA | Not applicable | |
| 2-Methylbutane (78-78-4) | | |
| ACGIH | ACGIH TWA (ppm) | 600 ppm |
| OSHA | Not applicable | |
| Propane (74-98-6) | | |
| ACGIH | ACGIH TWA (ppm) | 1000 ppm |
| OSHA | OSHA PEL (TWA) (mg/m ³) | 1800 mg/m ³ |
| OSHA | OSHA PEL (TWA) (ppm) | 1000 ppm |
| n-Pentane (109-66-0) | | |
| ACGIH | ACGIH TWA (ppm) | 600 ppm |
| OSHA | OSHA PEL (TWA) (mg/m ³) | 2950 mg/m ³ |
| OSHA | OSHA PEL (TWA) (ppm) | 1000 ppm |
| Methane (74-82-8) | | |
| ACGIH | ACGIH TWA (ppm) | 1000 ppm |
| OSHA | Not applicable | |

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.

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| | |
|---------------------------------|---|
| 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. |
| 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. |
|------------------------|--|

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).

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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

| Carbon dioxide (124-38-9) | |
|----------------------------------|---------------|
| LC50 inhalation rat (ppm) | 820000 ppm/4h |

| Ethane (74-84-0) | |
|----------------------------|--------------------|
| LC50 inhalation rat (mg/l) | 658 mg/l/4h |
| LC50 inhalation rat (ppm) | 820000 ppm/4h |
| ATE US (gases) | 820000.000 ppmV/4h |
| ATE US (vapors) | 658.000 mg/l/4h |
| ATE US (dust, mist) | 658.000 mg/l/4h |

| Nitrogen (7727-37-9) | |
|-----------------------------|---------------|
| LC50 inhalation rat (ppm) | 820000 ppm/4h |

| n-Butane (106-97-8) | |
|----------------------------|---|
| LC50 inhalation rat (mg/l) | 658 g/m ³ (Exposure time: 4 h) |
| LC50 inhalation rat (ppm) | 276789.28 ppm/4h |

| Isobutane (75-28-5) | |
|----------------------------|------------------|
| LC50 inhalation rat (mg/l) | 658 mg/l/4h |
| LC50 inhalation rat (ppm) | 276713.11 ppm/4h |

| 2-Methylbutane (78-78-4) | |
|---------------------------------|-----------------|
| LC50 inhalation rat (ppm) | 94859.36 ppm/4h |

| Propane (74-98-6) | |
|----------------------------|---------------|
| LC50 inhalation rat (mg/l) | 658 mg/l/4h |
| LC50 inhalation rat (ppm) | 282800 ppm/4h |

| n-Pentane (109-66-0) | |
|-----------------------------|---|
| LD50 dermal rabbit | 3000 mg/kg |
| LC50 inhalation rat (mg/l) | 364 g/m ³ (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 |

| Methane (74-82-8) | |
|---------------------------|--------------------|
| LC50 inhalation rat (ppm) | 820000 ppm/4h |
| ATE US (gases) | 820000.000 ppmV/4h |

Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Not classified
Respiratory or skin sensitization : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified

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

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| | |
|--|---|
| Specific target organ toxicity (repeated exposure) | : Not classified |
| 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 | : Adverse effects not expected from this product. |

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) |
| 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

| | |
|----------------------------------|---|
| Carbon dioxide (124-38-9) | |
| Persistence and degradability | No ecological damage caused by this product. |
| Ethane (74-84-0) | |
| Persistence and degradability | The substance is biodegradable. Unlikely to persist. |
| Nitrogen (7727-37-9) | |
| Persistence and degradability | No ecological damage caused by this product. |
| n-Butane (106-97-8) | |
| Persistence and degradability | No data available. |
| Isobutane (75-28-5) | |
| Persistence and degradability | The substance is biodegradable. Unlikely to persist. |
| 2-Methylbutane (78-78-4) | |
| Persistence and degradability | No data available. |
| Propane (74-98-6) | |
| Persistence and degradability | The substance is biodegradable. Unlikely to persist. |
| Methane (74-82-8) | |
| Persistence and degradability | The substance is biodegradable. Unlikely to persist. No data available. |

12.3. Bioaccumulative potential

| | |
|----------------------------------|---|
| Carbon dioxide (124-38-9) | |
| BCF fish 1 | (no bioaccumulation) |
| Log Pow | 0.83 |
| Bioaccumulative potential | No ecological damage caused by this product. |
| Ethane (74-84-0) | |
| Log Pow | 1.81 |
| Bioaccumulative potential | Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9. |
| Nitrogen (7727-37-9) | |
| Log Pow | Not applicable for inorganic gases. |
| Bioaccumulative potential | No ecological damage caused by this product. |

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| n-Butane (106-97-8) | |
|---------------------------------|---|
| Log Pow | 2.89 |
| Log Kow | Not applicable for gas-mixtures. |
| Bioaccumulative potential | Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9. |
| Isobutane (75-28-5) | |
| BCF fish 1 | 1.57 - 1.97 |
| Log Pow | 2.76 |
| 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. |
| Propane (74-98-6) | |
| Log Pow | 2.36 |
| 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 |
| Methane (74-82-8) | |
| Log Pow | Not applicable for gas mixtures |
| Log Kow | Not applicable for gas mixtures |
| Bioaccumulative potential | Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9. |

12.4. Mobility in soil

| Carbon dioxide (124-38-9) | |
|----------------------------------|---|
| Ecology - soil | No ecological damage caused by this product. |
| Ethane (74-84-0) | |
| Ecology - soil | Because of its high volatility, the product is unlikely to cause ground or water pollution. |
| Nitrogen (7727-37-9) | |
| Ecology - soil | No ecological damage caused by this product. |
| n-Butane (106-97-8) | |
| Mobility in soil | No data available. |
| Ecology - soil | Because of its high volatility, the product is unlikely to cause ground or water pollution. |
| Isobutane (75-28-5) | |
| 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. |
| Propane (74-98-6) | |
| Ecology - soil | Because of its high volatility, the product is unlikely to cause ground or water pollution. |
| Methane (74-82-8) | |
| Mobility in soil | No data available. |
| Ecology - soil | Because of its high volatility, the product is unlikely to cause ground or water pollution. |

12.5. Other adverse effects

| | |
|------------------------------|---|
| Effect on ozone layer | : No known effects from this product. |
| Effect on the global warming | : Contains greenhouse gas(es) not covered by 842/2006/EC. |

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. |
|-------------------------|---|

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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., 2.2

UN-No.(DOT) : UN3161

Proper Shipping Name (DOT) : Liquefied gas, flammable, n.o.s.

Transport hazard class(es) (DOT) : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115

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.

ADR

Transport document description : UN 3161 LIQUEFIED GAS, FLAMMABLE, N.O.S., 2.1, (B/D)

Class (ADR) : 2 - Gases

Hazard identification number (Kemler No.) : 23

Classification code (ADR) : 2F

Hazard labels (ADR) : 2.1 - Flammable gases



Orange plates



Tunnel restriction code (ADR) : B/D

Limited quantities (ADR) : 0

Excepted quantities (ADR) : E0

Transport by sea

UN-No. (IMDG) : 3161

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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

Carbon dioxide (124-38-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ethane (74-84-0)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Nitrogen (7727-37-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

n-Butane (106-97-8)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Isobutane (75-28-5)

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

Propane (74-98-6)

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.

Methane (74-82-8)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

Carbon dioxide (124-38-9)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification Class A - Compressed Gas

Ethane (74-84-0)

Listed on the Canadian DSL (Domestic Substances List)

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

Nitrogen (7727-37-9)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification Class A - Compressed Gas

n-Butane (106-97-8)

Listed on the Canadian DSL (Domestic Substances List)

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

Isobutane (75-28-5)

Listed on the Canadian DSL (Domestic Substances List)

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

2-Methylbutane (78-78-4)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification Class B Division 2 - Flammable Liquid

9 Components in Ethane

Safety Data Sheet

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

| | |
|---|--|
| Propane (74-98-6) | |
| 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 |
| Methane (74-82-8) | |
| Listed on the Canadian DSL (Domestic Substances List) | |
| WHMIS Classification | Class A - Compressed Gas Class B Division 1 - Flammable Gas |

EU-Regulations

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|--|
| Carbon dioxide (124-38-9) |
| Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) |
| Ethane (74-84-0) |
| Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) |
| Nitrogen (7727-37-9) |
| Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) |
| n-Butane (106-97-8) |
| Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) |
| Isobutane (75-28-5) |
| 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) |
| Propane (74-98-6) |
| 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) |
| Methane (74-82-8) |
| 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

| |
|--|
| Carbon dioxide (124-38-9) |
| 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) Listed on the Canadian IDL (Ingredient Disclosure List) |
| Ethane (74-84-0) |
| 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) |

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Nitrogen (7727-37-9)

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 Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

n-Butane (106-97-8)

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)

Isobutane (75-28-5)

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 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)

Propane (74-98-6)

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)

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)

Methane (74-82-8)

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)

15.3. US State regulations

Carbon dioxide (124-38-9)

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

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Ethane (74-84-0)

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

Nitrogen (7727-37-9)

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

n-Butane (106-97-8)

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

Isobutane (75-28-5)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) 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

Propane (74-98-6)

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

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

Methane (74-82-8)

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

SECTION 16: Other information

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

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Full text of H-phrases:

| | |
|-------------------|---|
| Aquatic Chronic 2 | Hazardous to the aquatic environment - Chronic Hazard Category 2 |
| Asp. Tox. 1 | Aspiration hazard Category 1 |
| Compressed gas | Gases under pressure Compressed gas |
| 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 |
| Repr. 2 | Reproductive toxicity Category 2 |
| Skin Irrit. 2 | Skin corrosion/irritation Category 2 |
| STOT RE 2 | Specific target organ toxicity (repeated exposure) 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 |
| H336 | May cause drowsiness or dizziness |
| H361 | Suspected of damaging fertility or the unborn child |
| H373 | May cause damage to organs through prolonged or repeated exposure |
| 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.