# Safety Data Sheet

(according to Regulation EC 1907/2006)

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|---|---|
| **Version No.** | **01/EN** |
| **Revision** | **N.A.** |
| **Printing date** | **09 Jun. 2015** |

## 1. IDENTIFICATION OF SUBSTANCE / MIXTURE AND OF THE COMPANY/UNDERTAKING

**1.1 Product identifier**

| | |
|---|---|
| Trade name | Lighter Refill Gas Canister |
| Registration no. | N.A. |

**1.2 Relevant identified uses of substance or mixture and uses advised against**

| | |
|---|---|
| Identified uses | Fuel etc. |

**1.3 Details of the supplier of the safety data sheet**

| | |
|---|---|
| Company | M.I.T. LIMITED |
| Telephone | +82-2-711-9160 |
| E-mail | mgchoi@mit21.net |

**1.4 Emergency telephone number** +82-10-3723-7861

(This number is serviced during office hours only.)

## 2. HAZARDS IDENTIFICATION

**2.1 Classification of the substance or mixture**

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

Flammable gases Cat. 1

Gases under pressure (Liquefied gas)

**2.1.2. Classification according to Directive 1999/45/EC**

Extremely flammable.

**2.2 Label elements**

**2.2.1 Labelling according Regulation (EC) No 1272/2008 [CLP]**

Symbol

| | |
|---|---|
| Signal word | DANGER |
| Hazard Statement | H220 Extremely flammable gas. |
| | H280 Contains gas under pressure; may explode if heated. |
| Precautionary statement | P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking. |
| | P410 + P403 Protect from sunlight. Store in a well-ventilated place. |

**2.2.2 According to European Directive 67/548/EEC as amended**

Hazard symbol(s)

| | |
|---|---|
| R-phrase(s) | R12 Extremely flammable. |
| S-phrase(s) | S 9 Keep container in a well-ventilated place. |
| | S16 Keep away from sources of ignition - No smoking. |

**2.3. Other hazards**

| | |
|---|---|
| CERCLA Index (0~3) | Health=1, Fire=3, Reactivity=0, Durability=0 |
| NFPA Index (0~4) | Health=1, Fire=4, Reactivity=0 |

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

### 3.1 Mixture

| Components | % | Classification |
|---|---|---|
| Iso-Butane<br>CAS No. 75-28-5 | 28.0 | Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]<br>- Flammable gases Cat. 1<br>- Gases under pressure (Liquefied gas)<br> |
| | | According to European Directive 67/548/EEC as amended.<br>- Extremely flammable.<br> |
| Propane<br>CAS No. 74-98-6 | 26.0 | Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]<br>- Flammable gases Cat. 1<br>- Gases under pressure (Liquefied gas)<br> |
| | | According to European Directive 67/548/EEC as amended.<br>- Extremely flammable.<br> |
| N-Butane<br>CAS No. 106-97-8 | 45.0 | Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]<br>- Flammable gases Cat. 1<br>- Gases under pressure (Liquefied gas)<br> |
| | | According to European Directive 67/548/EEC as amended.<br>- Extremely flammable.<br> |

## 4. FIRST AID MEASURES

### 4.1 Description of first aid measures

Inhalation

Move from the exposed areas immediately. Artificial respiration if needed.
Secure the airway, maintain blood pressure, and inhale oxygen if possible.
Keep a patient in a warm and comfortable condition.
Treat appropriately depending on the symptoms. Take a proper medical action.

| | |
|---|---|
| Skin contact | Thoroughly wash off with soft detergent and much water (15~20 minutes).<br>If there are symptoms such as frostbite and freezing, take the following process.<br>Warm the affected part with warm water of 107 °F (41.7 °C). Gently wrap the affected part in blanket. Take an immediate medical action. |
| Eye contact | Wash eyes immediately with much water or saline solution until no chemicals remain.<br>Take an immediate medical action. |
| Ingestion | Treat properly based on the symptoms.<br>Take an immediate medical action. |

## 5. FIRE FIGHTING MEASURES

**5.1 Extinguishing media**

Powder fire extinguisher, carbon dioxide (Use water or fog in case of a blaze)

**5.2 Special hazards arising from the substance or mixture**

May burst or explode if exposed to heat or spark.
Heavier than the air, and there is a possibility of ignition and backfire.
Container may explode by heat or fire.
Mixture of gas & air may explode.
Low electrical conduction may cause static electricity, and ignited by a spark.

**5.3 Advice for firefighters**

If not dangerous, remove from a fire area.
After putting out a fire, sprinkle cooling water in the side of the container which is exposed by heat.
Escape from the end of tank.
Use a fire hose or monitor nozzle if a blaze occurs in the stored area, and leave it burned if difficult.
Immediately remove if the size of blaze grows bigger or the tank is discolored by heat.
Leave it burned and isolate by more than 1 mile if we cannot stop the spills from gas tank, and tank lorry.
Extinguish it if the gas spills can be stopped. Use much water in a form of fog from a long distance.
Keep away outside a 8.045 km radius if fire is out of control or the container is exposed to a flame.
Don't inhale the smoke from the burning materials with one's back against the wind.

**5.4 Special Information**

No data available

## 6. ACCIDENTAL RELEASE MEASURES

**6.1 Personal precautions, protective equipment and emergency procedures**

Avoid heat, flame, spark and other source of ignition.
Do not touch a spilled material.
Do it if you can stop a spilled material with safety.
Sprinkle water in order to reduce vapour.
Isolate the area until the gas disperses.
Prohibit smoke, flame or fire at the dangerous area.
No entry to unauthorized persons, and isolate the dangerous and restricted area.
Ventilate the closed place before entering.

**6.2 Environmental precautions**

No data available

**6.3 Methods and material for containment and cleaning up**

No data available

## 7. HANDLING AND STORAGE

**7.1 Precautions for safe handling**

Store and handle in accordance with the regulations of a central government and local autonomous entity.

Recommend a practical training against static electricity.

**7.2 Conditions for safe storage, including any incompatibilities**

Please isolate and store the materials separated from other materials which shall not be put together at the same time.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**8.1 Occupational exposure limits**

Exposure standard : Industry safety & health law

| Components | OSHA TWA | ACGIH TWA | NIOSH TWA |
|---|---|---|---|
| Iso-Butane | No data | 800 ppm (1900 mg/$m^3$) | 800 ppm (1900 mg/$m^3$) |
| Propane | 1000 ppm (1800 mg/$m^3$) | 2500 ppm | 1000 ppm (1800 mg/$m^3$) |
| N-Butane | 800 ppm (1900 mg/$m^3$) | 800 ppm | 800 ppm (1900 mg/$m^3$) |

**8.2 Appropriate engineering controls**

Set up a partial ventilation or general diluted ventilation equipment.

Install explosion-screening facilities for the relevant ventilation equipment if there is a possibility of explosion for the material.

Employer shall install a washing equipment and shower stall near the work place because possibly employee's eye can be exposed to foreign materials

**8.3 Personal protection equipment**

| | |
|---|---|
| Eye protection | For the gas, eye protection not required, but recommended.<br>For the liquid, spray or dust protective goggles are needed to avoid a direct contact with foreign materials. Contact lense shall not be used |
| Protection clothes | For gas, protective clothing is not necessary.<br>In case of possible contact with liquid, employee must wear proper protection clothes and equipment in order to prevent a skin from freezing. |
| Protection gloves | Wear insulated gloves and gloves against the cold. |
| Respiratory protection | Below respirator and maximum use concentration is recommended by NISOH guide or allowance standard report about chemical hazard established by America Health and Human Services Department.<br>Specifically-selected respirator shall be based on pollutant density in a work place, and does not exceed the operation limit of respirator, and finally approved by NIOSH and NSHA at the same time. |

## 9. PHYSICAL & CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

| Properties | Iso-Butane | Propane | N-Butane |
|---|---|---|---|
| Appearance | liquid & vapor | liquid & vapor | liquid & vapor |
| Odor | odorless | odorless | odorless |
| Odor threshold | No data | No data | No data |
| pH | Not applicable | Not applicable | Not applicable |
| Melting point/Freezing point | -160°C | -187.7°C | -138.3°C |
| Boiling point and range | -11.5°C | -42.1°C | -0.5°C |
| Flash point | -88.0°C | -104.4°C | -73.3°C |
| Evaporation rate | 100% | 100% | 100% |
| Flammability (solid, gas) | no way to know | no way to know | no way to know |
| Upper/lower flammability or explosive limits | 8.4 vol%<br>1.8 vol% | 9.5 vol%<br>2.2 vol% | 8.4 vol%<br>1.9 vol% |
| Vapor pressure | 0.304MPa @20°C | 0.75MPa @20°C | 0.214MPa @21.1°C |
| Vapor density | 2.595(air=1) | 1.55(air=1) | 2.1(air=1) |
| Relative density | 0.549 @ 20°C | 0.501 @ 20°C | 0.549 @ 20°C |
| Solubility | no way to know | 0.007 g/100mL @ 20°C | 3.25 mL/100mL @ 20°C |
| Partition coefficient: n-octanol/water | 2.8 as log POW | 2.36 as log POW | 2.89 as log POW |
| Auto-ignition temperature | 460°C | 466.1°C | 287°C |
| Decomposition temperature | no way to know | no way to know | no way to know |
| Viscosity | No data | No data | No data |
| Explosive properties | No data | No data | No data |
| Oxidizing properties | No data | No data | No data |

## 10. STABILITY AND REACTIVITY

**10.1 Reactivity** Stable at a normal temperature and pressure

**10.2 Chemical stability** No data available.

**10.3 Possibility of hazardous reactions** No dangerous reactions known.

**10.4 Conditions to avoid** Avoid a contact with heat, flame, spark and other sources of ignition.
Vapor has a explosiveness.
Do not contact with a skin.
May cause frostbite.
Because of a pressure, containers may be burst if exposed to heat, and thus could move to a long distance.

**10.5 Incompatible materials** Strong oxidizer : Hazard of fire, explosion
Nitric acid, chlorine dioxide : Material to be avoided
Carbonyl nickel & acid: Explode at (20~40) ℃

**10.6 Hazardous decomposition products** Pyrolysis product may contain poisonous carbon oxidized substance

## 11. TOXICOLOGICAL INFORMATION

| | |
|---|---|
| **11.1 Routes of exposure** | No data available |
| **11.2 Information on toxicological effects** | |
| Acute toxicity | No toxicity by inhalation. |
| Skin corrosion/irritation | Contact with liquid may cause frostbite, ache, and water blister. |
| Serious eye damage/irritation | Not irritating (Rabbit)<br>Contact with liquid may cause frostbite, ache, and eyesight loss. |
| Respiratory or skin sensitisation | No data available |
| Germ cell mutagenicity | No data available |
| Carcinogenicity | This product is or contains a component that is probably not carcinogenic based on its IARC, ACGIH, NTP, or EPA classification. |
| Reproductive toxicity | No data available |
| STOT-single exposure | Simple asphyxiant, and central nervous system suppressant. |
| STOT-repeated exposure | No data available |
| Aspiration hazard | No data available |

## 12. ECOLOGICAL INFORMATION

| | |
|---|---|
| **12.1 Ecotoxicity** | No data available. |
| **12.2 Persistence and degradability** | No data available. |
| **12.3 Bioaccumulative potential** | No data available. |
| **12.4 Mobility in soil** | No data available. |
| **12.5 Other adverse effects** | No data available. |

## 13. DISPOSAL CONSIDERATIONS

| | |
|---|---|
| **13.1 Disposal instructions** | Comply with a central government and local autonomous entity regulations.<br>Disposal shall be executed by a standard of 40 CFR 262 applied for hazardous waste generator.<br>EPA hazardous waste No. D001. |
| **13.2 Waste from residues / unused products** | No data available. |
| **13.3 Contaminated packaging** | No data available. |

## 14. TRANSPORT INFORMATION

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|---|---|
| **14.1 UN number** | UN 2037<br>- Propane : LPG, UN 1075<br>- Iso-Butane : Iso-Butane, UN 1999<br>- N-Butane : N-Butane or N-Butane mixture UN 1011 |
| **14.2 UN proper shipping name** | RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable<br>LQ2 |

| | |
|---|---|
| **14.3 Transport hazard class(es)** | 2.1 |
| **14.4. Packing group** | N.A. |
| **14.5. Environmental hazards** | N.A. |
| **14.6. Special precautions for user** | Passenger plane or train : Prohibited<br>Cargo plane : 150 kg |

## 15. REGULATORY INFORMATION

**15.1 Regulatory information**

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

**15.2 Chemical Safety Assessment:**

No data available

**15.3 Inventory status**

No data available

## 16. OTHER INFORMATION

The contents and format of this MSDS/SDS are in accordance with Regulation (EC) No 1907/2006.

- **References**

  Other MSDS (TAEYANG Corporation, GS Caltex Corporation, Korea Petro Chemical Ind. Co., Ltd., Aldirch, Shell Trading International Limited etc.)

  KOSHA – Chemical information database system

  ESIS (European chemical Substances Information System) (http://ecb.jrc.ec.europa.eu/)

  International Uniform Chemical Information Database (IUCLID) (http://ecb.jrc.it/esis)

- **Abbreviation and acronyms**

  ACGIH – American Conference of Industrial Hygienists

  CAS - Chemical Abstracts Service

  CLP - Regulation on classification, labeling and packaging of substances and mixtures. (Directive67/548/EEC)

  EC - European Community

  EEC - The European Economic Community

  EPA - Environmental Protection Agency

  GHS - Global Harmonized System

  IARC - International Agency for Research on Cancer

  NIOSH - National Institute for Occupational Safety and Health

  NTP - The National Toxicology Program

  OSHA - Occupational Safety and Health Administration

  STOT - Specific Target Organ Toxicity

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