SAFETY DATA SHEET

LIQUEFIED NATURAL GAS

Date: 2015-11-10
No. FDS 001
Version 1.03

1. Product and Company Identification

Product Name: Liquefied Natural Gas
Reference: Safety Data Sheet from 2014-07-03
Chemical formula: CH₄
Product Type: Mixture of petroleum hydrocarbons
Product Use(s): Fuel or fuel supply for various processes
Synonym(s): LNG, liquid natural gas, natural gas in a liquid state
Manufacturer: Gaz Métro GNL s.e.c. ou Gaz Métro GNL 2013 s.e.c., Energir, LSR Plant
11201 Boul. Henri-Bourassa Est
Montreal (Québec) Canada H1C 1H2
Phone: 514 598 3339

Emergency Information
Web site: www.energir.com

2. Hazards Identification

Product Class

<table>
<thead>
<tr>
<th>Category</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable gas</td>
<td>1</td>
</tr>
<tr>
<td>Gas under pressure</td>
<td>H220</td>
</tr>
<tr>
<td>Simple Asphyxiant</td>
<td>1</td>
</tr>
<tr>
<td>Liquefied gas</td>
<td>H280</td>
</tr>
</tbody>
</table>

GHS symbol

Signal word: DANGER - ATTENTION
Hazard statement: H220 : Extremely flammable gas
H280 : Contains gas under pressure; may explode if heated

Precautionary statements

General: N.A.
Prevention: P202 : Do not handle until all safety precautions have been read and understood.
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 : Eliminate all ignition sources if safe to do so.
Storage: P403 : Store in a well ventilated place.
Disposal: N.A.
Other Hazards Information: Can displaced the oxygen and quickly cause asphyxiation.
SAFETY DATA SHEET

LIQUEFEDE NATURAL GAS

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>CAS #</th>
<th>% (mass)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methane</td>
<td>74-82-8</td>
<td>98.3</td>
</tr>
<tr>
<td>Ethane</td>
<td>74-84-0</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Additional Information
Other elementary hydrocarbons may be present as an impurity.

4. First-aid measures

First aid procedures

**Eye contact**
In case of frostbite or freezing, gently rinse eyes with warm water. **DO NOT RINSE THE EYES WITH HOT WATER.**
Keep the eyelids open wide to allow the liquid to evaporate.
If the person cannot tolerate the light, protect eyes with a bandage or handkerchief.
Do not put any ointment in the eyes without medical advice.
Consult a doctor immediately.

**Skin contact**
Remove contaminated clothing and rinse the affected area under warm water.
The exposed area may be warmed, but **DO NOT USE HOT WATER.**
Consult a doctor immediately in the event of frostbite or blisters.

**Inhalation**
Move the victim to the fresh air.
If the person is not breathing, call 911 or an ambulance, then administer CPR.
If breathing is difficult, give oxygen.
Never try to make an unconscious person drink. Do not leave victims unattended.
Consult a doctor immediately.

**Ingestion**
Rinse mouth and drink water in sips. **DO NOT INDUCE VOMITING.**
Never try to make an unconscious person drink.
Consult a doctor immediately.

**Important Symptoms & Health Effects**
**SIMPLE ASPHYXIANT:** a physiologically inert gas that exerts its action by displacing oxygen from the air. If the percentage by volume of oxygen falls under 19.5%, there is not enough to maintain oxygen saturation in the blood.

Indication of any immediate medical attention and special treatment needed
Not applicable

5. Fire-fighting measures

**Suitable extinguishing media**
Do not try to extinguish the fire if the gas leak cannot be stopped.
Dry chemical, powders, high expansion foam, carbon dioxide (CO₂).
Water spray may be used to cool the contents.

**Unsuitable extinguishing media**
Do not use carbon dioxide, low-expansion foam or a strong water spray directly on the liquefied gas.
Using water or any liquid at room temperature directly on the liquefied gas will instantaneously vaporize the gas.

**Dangerous Product Specific Hazards**
The vapours may form a flammable mixture with air, which, in case of ignition, may release an explosive force if in an enclosed space.
Risk of RPT (Rapid Phase Transition): the significant difference in temperature between the LNG and a hotter liquid may cause the "almost instantaneous" vaporization of the LNG. The sudden increase in total volume occupied by the LNG may generate a "cold explosion" shock wave (sudden generation of overpressure but without combustion).

**Hazardous Combustion Products**
Carbon monoxide (CO), Carbon dioxide (CO₂), fumes

**Particular Protective Equipment and Precautions for Firefighters**
Wear a supplied-air respirator near the leak to avoid any risk of asphyxiation.
Do not try to extinguish the fire if the gas leak cannot be stopped. Intervene at a distance, approaching downwind, if necessary. If needed, use a combustible gas detector (explosimeter).
Establish a security perimeter.
In case of fire, and if it can be done safely, close the gas inlet valve.
The vapours generated during a significant spill of liquefied gas may travel a long way to a distant ignition source and produce a flashback.
The spilled liquid may pool on the ground and flow toward lower points until the cloud temperature rise to more than -100 °C.
Cool the exposed containers with water spray. Help the gas cloud to disperse using a water spray.

6. Accidental release measures

**Personal Precautions, Protective Equipment and Emergency Procedures**

Activate the Emergency Measures Plan in case of a spill.
Evacuate non-essential personnel and establish a security perimeter.
Suppress or control all ignition sources.
Do not touch the spilled liquid.
Never respond alone to a significant incident.
Use only in well-ventilated areas. See also OSHA regulations regarding the handling of this product, including standard 29 CFR 1910.110: Storage and handling of liquefied petroleum gases.

**Environmental precautions**

Let the gas escape into the atmosphere.
Do not flush, or allow the LNG to flow, down the drain or into the sewer system. Check if combustible gas is present in the sewers, underground structures and buildings
In case of a bottle leak, close the bottle and return it to the supplier.
In case of significant quantities, consult the regional office of the environmental authority that has jurisdiction.

**Methods and materials for containment and cleaning up**

Check the condition and characteristics of the container.
Consider the meteorological conditions (wind speed and direction, temperature, humidity).
Stay upwind and, if possible, evaluate the direction taken by the product.
The vapour cloud may be white, but the color dissipates and there is always a risk of fire or explosion.
Use water spray to disperse vapours.
Isolate the area until the gas has dispersed.
Aerate and test the area before entering

7. Handling and storage

**Secure Handling Precautions**

Use only in well ventilated zones. See also OSHA regulations for the manipulation of this product, including the 29 CFR 1910.110 standard : Storage and handling of liquefied petroleum gases.
Handling must conform to the LSST stipulations and its regulations, such as the RSST (in particular sections VII and X), the RSSM and the CSTC.

**Secure Storage Conditions**

Keep away from naked flames, sparks and excessive temperatures.
Store only in containers approved for liquid natural gas.
Storage must conform to the LSST stipulations and its regulations, such as the RSST (in particular sections VII and X), the RSSM and the CSTC. According to the situation, the chapter Building of the Safety code and the CNPI can also apply.

**Incompatible materials**

This product is incompatible with these substances: air, oxygen, strong oxidizing agents, compounds of chlorine or fluorine, and other halides.

8. Exposure controls/personal protection

<table>
<thead>
<tr>
<th>NOM CHIMIQUE</th>
<th># CAS</th>
<th>Type</th>
<th>Valeur</th>
<th>Remarque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methane</td>
<td>74-82-8</td>
<td></td>
<td>Simple asphyxiant</td>
<td></td>
</tr>
<tr>
<td>Ethane</td>
<td>74-84-0</td>
<td></td>
<td>Simple asphyxiant</td>
<td></td>
</tr>
</tbody>
</table>

**Other Information**

None known
SAFETY DATA SHEET

LIQUEFIED NATURAL GAS

Date: 2015-11-10
No. FDS 001
Version 1.0
Last edition: 2020-08-18

Appropriate engineering controls
N.A.

Personal protective equipment (PPE)

Eye/face protection
Wear eye protection if there is a risk of refrigerated liquefied gas splatters. The choice of eye protection, goggles, face shields, etc., depends on the nature of the work to be done and the risk of exposure.

Skin and body protection
In case of a risk of contact with refrigerated liquefied gas, wear a face shield and waterproof low-temperature-resistant clothing (apron, cryogenic gloves). Flame-retardant clothing may also be worn, depending on the nature of the work and the risk of fire.

Respiratory protection
Wear a supplied-air respirator if the gas concentration in working areas is presenting any risk of asphyxiation.
Use a NIOSH / MSHA approved protector with positive air pressure, a respirator with adduction of air or an autonomous respiratory system (ARS) in situations where the content in oxygen atmosphere is deficient or uncertain.
Attention: the limits of flammability should be considered during the evaluation of the necessity of exposing the staff to concentrations requiring a respiratory protection.
Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992 or to NIOSH Respirator Decision Logic, the CSA Z94.4-93standard process to get more advice about the selection of a respiratory protection equipment.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance (form, color)</td>
<td>Liquefied gas (cryogenic fluid)</td>
</tr>
<tr>
<td></td>
<td>Clear liquid</td>
</tr>
<tr>
<td></td>
<td>Cold vapour; white cloud</td>
</tr>
<tr>
<td>Odor</td>
<td>Odourless (or very faint odour)</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>None</td>
</tr>
<tr>
<td>pH</td>
<td>N.A.</td>
</tr>
<tr>
<td>Melting / freezing point</td>
<td>-182.47°C</td>
</tr>
<tr>
<td>Initial boiling point and boiling</td>
<td>-161.5 °C (1 atm)</td>
</tr>
<tr>
<td>range</td>
<td>-136 °C (methane)</td>
</tr>
<tr>
<td>Flash point</td>
<td>N.A.</td>
</tr>
<tr>
<td>Evaporation Rate (ether = 1)</td>
<td>N.A.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>N.A.</td>
</tr>
<tr>
<td>Upper / lower flammability or</td>
<td>Upper: 15.4% à 25 °C</td>
</tr>
<tr>
<td>explosive</td>
<td>Lower: 5.0% à 25 °C</td>
</tr>
</tbody>
</table>

10. Chemical Stability and Reactivity Information

Reactivity
Keep away from sources of ignition and heat, high temperatures, open flames, sparks, welding, static electricity and other ignition sources. Do not smoke.

Chemical stability
Stable under normal conditions of use, storage, and transportation.

Hazardous polymerization
Hazardous polymerization does not occur.

Conditions to avoid
Gaseous methane, within the flammable or explosive limits, can easily ignite if subject to a sufficiently high-energy electrostatic discharge.

Incompatible materials
May burn or explode in a confined space when mixed with strong oxidizing agents (peroxide, chlorine, chlorine dioxide, liquid oxygen)

Dangerous decomposition products
CO, CO₂, fumes (combustion)
11. Toxicological Information

Information on the likely routes of exposure

Inhalation and skin contact. Physiologically inert. Ingestion is not likely to happen during normal industrial use.

Health effects associated with ingredients

Inhalation/Skin/Eyes

Tissue damage caused by frostbite on contact with liquefied gas. The vapours are not irritants. However, direct contact of the eyes, skin or mucous membranes with the cold vapours or liquid gas may cause frostbite, burns and permanent ocular and skin lesions. The signs of frostbite are a change in the colour of the skin to grey or white, followed later by blisters. The skin may become inflamed and painful. The vapours have a narcotic effect. Because of the very rapid rate of evaporation, all the air may be displaced, leading to a risk of asphyxiation. Methane is a simple asphyxiant. Exposure to very high concentrations of methane may induce asphyxiation since it displaces the oxygen in the air. The principal symptoms associated with asphyxiation are rapid pulse and respiration, headaches, dizziness, visual problems, mental confusion, impaired coordination, mood changes, muscular weakness, trembling, cyanosis, narcosis, numbness of the extremities, unconsciousness leading to a lesion in the central nervous system that may result in death by anoxia. The effects of asphyxiation may be felt more rapidly during physical effort since oxygen consumption is increased. Even though considered non-toxic by inhalation, exposure to high concentrations of LNG may cause a depression of the nervous system (rapid respiration, dizziness, somnolence, headaches—symptoms similar to those of drug use), but without any long-term effects. People with pre-existing heart, lung and/or blood conditions may have an increased sensitivity to symptoms of asphyxiation.

Acute Toxicology Data

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>CAS</th>
<th>LD&lt;sub&gt;50&lt;/sub&gt;</th>
<th>LC&lt;sub&gt;50&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methane</td>
<td>74-82-8</td>
<td>N.A.</td>
<td>35 355 ppm 4 hours (mouse)</td>
</tr>
<tr>
<td>Ethane</td>
<td>74-84-0</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Skin Corrosion/Irritation

This product is not irritating, but may cause frostbite on contact with liquefied gas.

Eye Corrosion/Irritation

Tissue damage caused by frostbite on contact with liquefied gas. The vapours are not irritants. However, direct contact of the eyes, skin or mucous membranes with the cold vapours or liquid gas may cause frostbite, burns and permanent ocular and skin lesions.

Skin/Respiratory Sensitization

No data concerning the respiratory or skin sensitization was found in the consulted documentary sources.

Specific target organ toxicity

No data concerning the effect on the target organs was found in the consulted documentary sources.

Carcinogenicity

No data concerning the carcinogenic effect was found in the consulted documentary sources (OSHA, ACGIH).

Reproductive Effects

No data concerning the reproductive effect was found in the consulted documentary sources.

Germ Cells Mutagenicity

No data concerning the in vivo or in vitro mutagenic effect on germ cells from mammals was found in the consulted documentary sources.

12. Ecological Information

Aquatic Ecotoxicity

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS</th>
<th>CL&lt;sub&gt;50&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methane</td>
<td>74-82-8</td>
<td>N.A.</td>
</tr>
<tr>
<td>Ethane</td>
<td>74-84-0</td>
<td>N.A.</td>
</tr>
</tbody>
</table>
Land Ecotoxicity
This material is not harmful to environment.

Persistence and degradability
The product is not persistent in the environment.

Bioaccumulation potential
The product is not bioaccumulating.

Mobility in soil
Not considered mobile.

Other adverse effects
No data available

13. Disposal considerations

Disposal instructions
Let the gas escape into the atmosphere.
In case of a bottle leak, close the bottle and return it to the supplier.

14. Transportation Information

<table>
<thead>
<tr>
<th>UN Identification</th>
<th>UN 1972</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper shipping name</td>
<td>NATURAL GAS, REFRIGERATED LIQUID (with high methane content)</td>
</tr>
<tr>
<td>Class</td>
<td>2.1</td>
</tr>
<tr>
<td>Packing group</td>
<td>N.A.</td>
</tr>
<tr>
<td>Environmental Hazards</td>
<td>This material is not harmful to aquatic life or environment.</td>
</tr>
<tr>
<td>Additional description &amp; information</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

15. Regulatory Information

Applicable Regulations
Product classification and SDS have been elaborated in accordance to DGR.
This product has been classified according to the criteria of the DGR and the SDS contains all the information required by the DGR.
Act respecting Occupational Health and Safety (AOHS) (CQLR, c. S-2.1)
Regulation respecting Occupational Health and Safety (c. S-2.1, r. 19.01)
The product is controlled according to WHMIS 2015.
In Canada, all ingredients are part of the Domestic Substances List (DSL)

16. Other information

Prepared by
Envirospec for Energir
www.envirospec.qc.ca

SDS history
First edition 2015-11-10 (French)

SDS status
Active

Other information
The information in this data sheet was written based on the best knowledge and the best experience currently available.

Références
ACGIH. _Guide to Occupational Exposure Values 2012_, Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH)
CANUTEC
CSST. _Service du répertoire toxicologique._
GOVERNEMENT DU QUÉBEC. _Règlement sur la santé et la sécurité du travail (c.S-2.1, r.19.01)_ Update August 1st 2015
Transport Canada, _Règlement sur le transport des marchandises dangereuses (RTMD)_
SAFETY DATA SHEET

LIQUEFIED NATURAL GAS


U.S. NATIONAL FIRE PROTECTION ASSOCIATION. Standards
   NFPA 77, Standard for Static Electricity
   NFPA 68, Standard on Explosion Protection by Deflagration Venting
   NFPA 69, Standard on Explosion Prevention Systems

Acronyms
   ACGIH: American Conference of Governmental Industrial Hygienists
   AICS: Australian Inventory of Chemical Substances
   CAS: Chemical Abstract Services
   CNPI: Canadian National Fire Code
   CPR: Cardiopulmonary resuscitation
   CSA: Canadian Standardization Association
   CSST: Commission de la santé et sécurité du travail (Occupational Health and Safety Commission, Quebec)
   CSTC: Safety Code for the Construction Industry
   DGR: Dangerous Good Regulation
   DSL: Domestic Substances List (Canada)
   ECL: Existing Chemicals List
   GHS: Globally Harmonised System of Classification and Labelling of Chemicals
   IARC: International Agency for Research on Cancer
   LC: Lethal Concentration
   LD: Lethal Dose
   N.A.: Not Applicable / Not Available
   NFPA: National Fire Protection Association
   NIOSH: National Institute for Occupational Safety and Health
   NTP: National Toxicology Program
   OEL: Occupational Exposure Limit
   ONU: Organisation des Nations Unies
   OSHA: Occupational Safety and Health Administration
   QC: Quebec Province, Canada
   REPTOX: CSST Toxicological Directory
   ROHS: Regulation respecting Occupational Health and Safety
   RPC: Chemical Products Regulation
   RSSM: Health and Security Regulation for Mine Industry
   RTMD: Transportation of Dangerous Goods Regulations
   SDS: Safety Data Sheet
   STEL: Short Term Exposure Limit
   TSCA: Toxic Substances Control Act
   TWA: Time Weighted Average
   WHMIS: Workplace Hazardous Materials Information System