

**Safety Data Sheet**  
acc. to OSHA HCS (29 CFR 1910.1200)

Printing date: 11/08/2016

Revision: 11/08/2016

**1 Identification**

- **Product identifier**
- **Trade name:** Natural Gas Liquids (NGL Mix)
- **Product code:** No other identifiers
- **CAS Number:**  
64741-48-6
- **Recommended use and restriction on use**
- **Recommended use:** Fuel
- **Restrictions on use:** Contact manufacturer/supplier
- **Details of the supplier of the Safety Data Sheet**
- **Manufacturer/Supplier:**  
LINN Operating, Inc.  
600 Travis  
Houston, TX 77002  
281.840.4000
- **Emergency telephone number:** 866.951.9825

**2 Hazard(s) identification**

- **Classification of the substance or mixture**
- Flam. Gas 1            H220 Extremely flammable gas.
- Press. Gas            H280 Contains gas under pressure; may explode if heated.
- Muta. 1B              H340 May cause genetic defects.
- Carc. 1A              H350 May cause cancer.
- STOT RE 1            H372 Causes damage to organs through prolonged or repeated exposure.
- Asp. Tox. 1           H304 May be fatal if swallowed and enters airways.
- Simple Asphyxiant    May displace oxygen and cause rapid suffocation.
- **Additional information:**  
Repeated exposure may cause skin dryness or cracking.  
In use may form flammable/explosive vapour-air mixture.

· **Label elements**

· **GHS label elements**

The substance is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms:**



GHS02 GHS04 GHS08

· **Signal word:** Danger

· **Hazard statements:**

- H220 Extremely flammable gas.
- H280 Contains gas under pressure; may explode if heated.
- H340 May cause genetic defects.
- H350 May cause cancer.
- H372 Causes damage to organs through prolonged or repeated exposure.

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H304 May be fatal if swallowed and enters airways.  
May displace oxygen and cause rapid suffocation.

**Precautionary statements:**

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P260 Do not breathe mist/vapors/spray.
- P264 Wash thoroughly after handling.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P270 Do not eat, drink or smoke when using this product.
- P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
- P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
- P314 Get medical advice/attention if you feel unwell.
- P331 Do NOT induce vomiting.
- P381 Eliminate all ignition sources if safe to do so.
- P308+P313 IF exposed or concerned: Get medical advice/attention.
- P405 Store locked up.
- P410+P403 Protect from sunlight. Store in a well-ventilated place.
- P501 Dispose of contents/container in accordance with local/regional/national/international regulations.










· **Other hazards** There are no other hazards not otherwise classified that have been identified.

### 3 Composition/information on ingredients

**Chemical characterization: Substances**
**CAS No. Description**

64741-48-6 Natural gas (petroleum), raw liq. mix

**Components:**

74-98-6	propane  Flam. Gas 1, H220  Press. Gas, H280	0-85%
74-84-0	ethane  Flam. Gas 1, H220  Press. Gas, H280	0-50%
106-97-8	butane  Flam. Gas 1, H220  Press. Gas, H280	0-40%
109-66-0	pentane  Flam. Liq. 2, H225  Asp. Tox. 1, H304  STOT SE 3, H336	0-10%

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71-43-2	benzene  Flam. Liq. 2, H225  Muta. 1B, H340; Carc. 1A, H350; STOT RE 1, H372; Asp. Tox. 1, H304  Skin Irrit. 2, H315; Eye Irrit. 2, H319	0.1-5%
110-54-3	hexanes  Flam. Liq. 2, H225  Acute Tox. 4, H332	0-2%
74-82-8	methane  Flam. Gas 1, H220  Press. Gas, H280	0.01-1%
124-38-9	carbon dioxide  Press. Gas, H280	0-1%
7783-06-4	hydrogen sulphide  Flam. Gas 1, H220  Press. Gas, H280  Acute Tox. 2, H330	0-0.1%

## 4 First-aid measures

- **Description of first aid measures**

- **General information:**

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

Take affected persons out into the fresh air.

- **After inhalation:**

Remove victim to fresh air.

Seek immediate medical advice.

Provide oxygen treatment if affected person has difficulty breathing.

In case of unconsciousness place patient stably in side position for transportation.

- **After skin contact:**

Wash with soap and water.

If skin irritation continues, consult a doctor.

In cases of frostbite, rinse with plenty of water. Do not remove clothing.

- **After eye contact:**

Remove contact lenses if worn.

Rinse opened eye for several minutes under running water. Then consult a doctor.

- **After swallowing:**

Unlikely route of exposure.

A person vomiting while lying on their back should be turned onto their side.

Rinse out mouth and then drink plenty of water.

Do not induce vomiting; immediately call for medical help.

- **Most important symptoms and effects, both acute and delayed:**

Breathing difficulty

Coughing

Dizziness

Frostbite

Disorientation

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- **Danger:**  
 Repeated exposure may cause skin dryness or cracking.  
 Danger of impaired breathing.  
 May be fatal if swallowed and enters airways.  
 May cause cancer.  
 May cause cancer by inhalation.  
 May cause genetic defects.  
 Causes damage to organs through prolonged or repeated exposure.
- **Indication of any immediate medical attention and special treatment needed:**  
 If swallowed, gastric irrigation with added, activated carbon.  
 If swallowed or in case of vomiting, danger of entering the lungs.  
 If necessary oxygen respiration treatment.  
 Later observation for pneumonia and pulmonary edema.  
 If medical advice is needed, have product container or label at hand.

## 5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**  
 Gaseous extinguishing agents  
 Carbon dioxide  
 Water fog / haze  
 Foam
- **For safety reasons unsuitable extinguishing agents:** Water stream.
- **Special hazards arising from the substance or mixture**  
 Formation of toxic gases is possible during heating or in case of fire.  
 Danger of receptacles bursting because of high vapor pressure if heated.  
 Extremely flammable gas.
- **Advice for firefighters**
- **Protective equipment:**  
 Wear self-contained respiratory protective device.  
 Wear fully protective suit.
- **Additional information:**  
 Eliminate all ignition sources if safe to do so.  
 Cool endangered receptacles with water spray.  
 In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.  
 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

## 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**  
 Use respiratory protective device against the effects of fumes/dust/aerosol.  
 Wear protective equipment. Keep unprotected persons away.  
 Ensure adequate ventilation.  
 Keep away from ignition sources.  
 Protect from heat.

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- **Environmental precautions**  
Do not allow to enter sewers/ surface or ground water.  
Inform authorities in case of gas release.
- **Methods and material for containment and cleaning up**  
Allow to evaporate.  
Absorb liquid components with non-combustible liquid-binding material.  
Send for recovery or disposal in suitable receptacles.
- **Reference to other sections**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

## 7 Handling and storage

- **Handling**
- **Precautions for safe handling:**  
Use only in well ventilated areas.  
Ensure good interior ventilation, especially at floor level. (Fumes are heavier than air).
- **Information about protection against explosions and fires:**  
Keep ignition sources away - Do not smoke.  
Protect against electrostatic charges.  
Keep respiratory protective device available.  
Emergency cooling must be available in case of nearby fire.  
Flammable gas-air mixtures may be formed in empty containers/receptacles.
- **Conditions for safe storage, including any incompatibilities**
- **Storage**
- **Requirements to be met by storerooms and receptacles:**  
Store in a cool location.  
Provide ventilation for receptacles.  
Observe official regulations on storing packagings with pressurized containers.
- **Information about storage in one common storage facility:**  
Store away from foodstuffs.  
Store away from oxidizing agents.
- **Further information about storage conditions:**  
Keep containers tightly sealed.  
Store in a cool place. Heat will increase pressure and may lead to the receptacle bursting.
- **Specific end use(s)** No relevant information available.

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## 8 Exposure controls/personal protection

### · Control parameters

#### · Components with limit values that require monitoring at the workplace:

##### 71-43-2 benzene

PEL (USA)	Short-term value: 15* mg/m <sup>3</sup> , 5* ppm Long-term value: 3* mg/m <sup>3</sup> , 1* ppm *table Z-2 for exclusions in 29CFR1910.1028(d)
REL (USA)	Short-term value: 1 ppm Long-term value: 0.1 ppm See Pocket Guide App. A
TLV (USA)	Short-term value: 8 mg/m <sup>3</sup> , 2.5 ppm Long-term value: 1.6 mg/m <sup>3</sup> , 0.5 ppm Skin; BEI
EL (Canada)	Short-term value: 2.5 ppm Long-term value: 0.5 ppm Skin; ACGIH A1; IARC 1
EV (Canada)	Short-term value: 2.5 ppm Long-term value: 0.5 ppm Skin
LMPE (Mexico)	Short-term value: 2.5 ppm Long-term value: 0.5 ppm A1, PIEL, IBE

##### 74-98-6 propane

PEL (USA)	Long-term value: 1800 mg/m <sup>3</sup> , 1000 ppm
REL (USA)	Long-term value: 1800 mg/m <sup>3</sup> , 1000 ppm
TLV (USA)	refer to Appendix F in TLVs&BEIs book; NIC-EX
EL (Canada)	Long-term value: 1000 ppm
EV (Canada)	Long-term value: 1000 ppm
LMPE (Mexico)	Long-term value: 1000 ppm

##### 74-84-0 ethane

TLV (USA)	Refer to Appendix F in TLVs & BEIs book; NIC-EX
EL (Canada)	Long-term value: 1000 ppm
EV (Canada)	Long-term value: 1.000 ppm
LMPE (Mexico)	Long-term value: 1000 ppm

##### 106-97-8 butane

REL (USA)	Long-term value: 1900 mg/m <sup>3</sup> , 800 ppm
TLV (USA)	Short-term value: (2370) mg/m <sup>3</sup> , (1000) ppm NIC-EX
EL (Canada)	Short-term value: 750 ppm Long-term value: 600 ppm
EV (Canada)	Long-term value: 800 ppm
LMPE (Mexico)	Long-term value: 1000 ppm

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**109-66-0 pentane**

PEL (USA)	Long-term value: 2950 mg/m <sup>3</sup> , 1000 ppm
REL (USA)	Long-term value: 350 mg/m <sup>3</sup> , 120 ppm Ceiling limit value: 1800* mg/m <sup>3</sup> , 610* ppm *15-min
TLV (USA)	Long-term value: 2950 mg/m <sup>3</sup> , 1000 ppm
EL (Canada)	Long-term value: 600 ppm
EV (Canada)	Short-term value: 2.210 mg/m <sup>3</sup> , 750 ppm Long-term value: 1.770 mg/m <sup>3</sup> , 600 ppm
LMPE (Mexico)	Long-term value: 600 ppm

**110-54-3 hexanes**

PEL (USA)	Long-term value: 1800 mg/m <sup>3</sup> , 500 ppm
REL (USA)	Long-term value: 180 mg/m <sup>3</sup> , 50 ppm
TLV (USA)	Long-term value: 176 mg/m <sup>3</sup> , 50 ppm Skin; BEI
EL (Canada)	Long-term value: 20 ppm Skin
EV (Canada)	Long-term value: 176 mg/m <sup>3</sup> , 50 ppm
LMPE (Mexico)	Long-term value: 50 ppm PIEL, IBE

**74-82-8 methane**

TLV (USA)	refer to Appendix F in TLVs and BEIs book
EL (Canada)	Long-term value: 1000 ppm
EV (Canada)	Long-term value: 1.000 ppm
LMPE (Mexico)	Long-term value: 1000 ppm

**124-38-9 carbon dioxide**

PEL (USA)	Long-term value: 9000 mg/m <sup>3</sup> , 5000 ppm
REL (USA)	Short-term value: 54.000 mg/m <sup>3</sup> , 30.000 ppm Long-term value: 9000 mg/m <sup>3</sup> , 5000 ppm
TLV (USA)	Short-term value: 54.000 mg/m <sup>3</sup> , 30.000 ppm Long-term value: 9000 mg/m <sup>3</sup> , 5000 ppm
EL (Canada)	Short-term value: 15000 ppm Long-term value: 5000 ppm
EV (Canada)	Short-term value: 54000 mg/m <sup>3</sup> , 30000 ppm Long-term value: 9000 mg/m <sup>3</sup> , 5000 ppm
LMPE (Mexico)	Short-term value: 30000 ppm Long-term value: 5000 ppm

**7783-06-4 hydrogen sulphide**

PEL (USA)	Ceiling limit value: 20; 50* ppm *10-min peak; once per 8-hr shift
REL (USA)	Ceiling limit value: 15* mg/m <sup>3</sup> , 10* ppm *10-min

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TLV (USA)	Short-term value: 7 mg/m <sup>3</sup> , 5 ppm Long-term value: 1.4 mg/m <sup>3</sup> , 1 ppm
EL (Canada)	Ceiling limit value: 10 ppm
EV (Canada)	Short-term value: 15 ppm Long-term value: 10 ppm
LMPE (Mexico)	Short-term value: 5 ppm Long-term value: 1 ppm

**Ingredients with biological limit values:**
**71-43-2 benzene**

BEI (USA)	25 µg/g creatinine Medium: urine Time: end of shift Parameter: S-Phenylmercapturic acid (background)
	500 µg/g creatinine Medium: urine Time: end of shift Parameter: t,t-Muconic acid (background)

**110-54-3 hexanes**

BEI (USA)	0.4 mg/L Medium: urine Time: end of shift at end of workweek Parameter: 2,5-Hexanedione without hydrolysis
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**Exposure controls**
**Personal protective equipment:**
**General protective and hygienic measures:**

- The usual precautionary measures for handling chemicals should be followed.
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.
- Wash hands before breaks and at the end of work.
- Store protective clothing separately.
- Do not inhale gases / fumes / aerosols.

**Engineering controls:**

- Provide adequate ventilation.
- Ground/bond container and receiving equipment.
- Take precautionary measures against static discharge.
- Use only non-sparking tools.
- Use explosion-proof electrical/ventilating/lighting/equipment.

**Breathing equipment:**

- Use suitable respiratory protective device when high concentrations are present.
- Use suitable respiratory protective device when aerosol or mist is formed.
- NIOSH or EN approved organic vapor respirator equipped with a dust/mist prefilter should be used.

**Protection of hands:**


Protective gloves

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Gloves should provide protection from freezing temperatures.  
Wear gloves for the protection against mechanical hazards according to OSHA and NIOSH rules.

· **Eye protection:**



Safety glasses

Face protection

· **Body protection:** Protective work clothing

· **Limitation and supervision of exposure into the environment**

No relevant information available.

## 9 Physical and chemical properties

· **Information on basic physical and chemical properties**

· **Appearance:**

**Form:** Liquefied gas

**Color:** Colorless

· **Odor:** Petroleum-like

· **Odor threshold:** Not determined.

· **pH-value:** Not determined.

· **Melting point/Melting range:** Not determined.

· **Boiling point/Boiling range:** -96 to 170 °C (-141 to 338 °F)

· **Flash point:** < -40 °C (< -40 °F)

· **Flammability (solid, gaseous):** Extremely flammable liquefied gas.

· **Auto-ignition temperature:** Not determined.

· **Decomposition temperature:** Not determined.

· **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

· **Explosion limits**

**Lower:** 1.1 Vol %

**Upper:** 15 Vol %

· **Oxidizing properties:** Not determined.

· **Vapor pressure:** Not determined.

· **Density at 20 °C (68 °F):** 0.5 - 0.7 g/cm<sup>3</sup> (4.173 - 5.842 lbs/gal)

· **Relative density:** Not determined.

· **Vapor density at 20 °C (68 °F):** 1 - 3 (Air = 1.0)

· **Evaporation rate:** Not applicable.

· **Solubility in / Miscibility with**

**Water:** Not miscible or difficult to mix.

· **Partition coefficient (n-octanol/water):** Not determined.

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- **Viscosity**
  - Dynamic:** Not determined.
  - Kinematic:** Not determined.
- **Other information** No relevant information available.

## 10 Stability and reactivity

- **Reactivity:** No relevant information available.
- **Chemical stability:** Stable under normal temperatures and pressures.
- **Thermal decomposition / conditions to be avoided:**  
Danger of receptacles bursting because of high vapor pressure if heated.
- **Possibility of hazardous reactions**  
Extremely flammable gas.  
Reacts violently with oxidizing agents.  
Toxic fumes may be released if heated above the decomposition point.  
Can form explosive mixtures in air if heated above flash point and/or when sprayed or atomized.
- **Conditions to avoid**  
Keep ignition sources away - Do not smoke.  
Store away from oxidizing agents.
- **Incompatible materials** No relevant information available.
- **Hazardous decomposition products**  
  
Under fire conditions only:  
Carbon monoxide and carbon dioxide  
Hydrocarbons

## 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**

- **LD/LC50 values that are relevant for classification:**

### ATE (Acute Toxicity Estimates)

Oral	LD50	>5000 mg/kg (rat)
Inhalative	LC50/4h	>100 mg/l (mouse)

### 71-43-2 benzene

Oral	LD50	4894 mg/kg (rat)
Inhalative	LC50/4h	9980 mg/l (mouse)

- **Primary irritant effect:**
- **On the skin:** Based on available data, the classification criteria are not met.
- **On the eye:** Based on available data, the classification criteria are not met.
- **Sensitization:** Based on available data, the classification criteria are not met.

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- **Carcinogenic categories**

- **IARC (International Agency for Research on Cancer):**

71-43-2 benzene

1

- **NTP (National Toxicology Program):**

71-43-2 benzene

K

- **OSHA-Ca (Occupational Safety & Health Administration):**

71-43-2 benzene

- **Probable route(s) of exposure:**

Inhalation.

Eye contact.

Skin contact.

- **Acute effects (acute toxicity, irritation and corrosivity):**

May displace oxygen and cause rapid suffocation.

May be fatal if swallowed and enters airways.

Frostbite

- **Repeated dose toxicity:**

May cause cancer.

May cause genetic defects.

Causes damage to organs through prolonged or repeated exposure.

- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**

Muta. 1B, Carc. 1A

- **Germ cell mutagenicity:** May cause genetic defects.

- **Carcinogenicity:**

May cause cancer.

May cause cancer by inhalation.

- **Reproductive toxicity:** Based on available data, the classification criteria are not met.

- **STOT-single exposure:** Based on available data, the classification criteria are not met.

- **STOT-repeated exposure:** Causes damage to organs through prolonged or repeated exposure.

- **Aspiration hazard:** May be fatal if swallowed and enters airways.

## 12 Ecological information

- **Toxicity**

- **Aquatic toxicity** No relevant information available.

- **Persistence and degradability** No relevant information available.

- **Bioaccumulative potential:** No relevant information available.

- **Mobility in soil:** No relevant information available.

- **Additional ecological information**

- **General notes:**

Do not allow product to reach ground water, water course or sewage system, even in small quantities.

Danger to drinking water if even extremely small quantities leak into the ground.

- **Other adverse effects** No relevant information available.

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## 13 Disposal considerations

- **Waste treatment methods**

- **Recommendation:**

Contact waste processors for recycling information.

The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes. Residual materials should be treated as hazardous.

- **Uncleaned packagings**

- **Recommendation:** Disposal must be made according to official regulations.

## 14 Transport information

- **UN-Number**

- DOT, ADR, IMDG, IATA

UN1075

- **UN proper shipping name**

- DOT, IATA

Petroleum gases, liquefied

- ADR, IMDG

PETROLEUM GASES, LIQUEFIED

- **Transport hazard class(es)**

- DOT



- Class

2 Gases

- Label

2.1

- ADR



- Class

2 2F Gases

- Label

2.1

- IMDG, IATA



- Class

2 Gases

- Label

2.1

- **Packing group**

This UN-number is not assigned a packing group.

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- **Environmental hazards**
- **Marine pollutant:** No
- **Special precautions for user** Warning: Gases
- **Danger code (Kemler):** 23
- **EMS Number:** F-D,S-U
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

- **Transport/Additional information:**

- **IATA**



Cargo Aircraft Only.

## 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **United States (USA)**
- **SARA**

- **Section 302 (extremely hazardous substances):**

7783-06-4 | hydrogen sulphide

- **Section 304 (emergency release notification):**

7783-06-4 | hydrogen sulphide

- **Section 355 (extremely hazardous substances):**

7783-06-4 | hydrogen sulphide

- **Section 313 (Specific toxic chemical listings):**

71-43-2 | benzene

7783-06-4 | hydrogen sulphide

- **TSCA (Toxic Substances Control Act)**

Substance is listed.

- **Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):**

74-98-6 | propane

10000

74-84-0 | ethane

10000

106-97-8 | butane

10000

109-66-0 | pentane

10000

74-82-8 | methane

10000

7783-06-4 | hydrogen sulphide

10000

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**· Proposition 65 (California)**
**· Chemicals known to cause cancer:**

71-43-2 benzene

**· Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

**· Chemicals known to cause reproductive toxicity for males:**

71-43-2 benzene

**· Chemicals known to cause developmental toxicity:**

71-43-2 benzene

**· Carcinogenic categories**
**· EPA (Environmental Protection Agency):**

71-43-2 benzene

A, K/L

7783-06-4 hydrogen sulphide

I

**· IARC (International Agency for Research on Cancer):**

71-43-2 benzene

1

**· NIOSH-Ca (National Institute for Occupational Safety and Health):**

71-43-2 benzene

## 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Date of preparation / last revision** 11/08/2016 / -

**· Abbreviations and acronyms:**

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety &amp; Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

BEI: Biological Exposure Limit

LDLo: Lowest Lethal Dose Observed

Flam. Gas 1: Flammable gases – Category 1

Press. Gas: Gases under pressure – Compressed gas

Press. Gas: Gases under pressure – Liquefied gas

Flam. Liq. 2: Flammable liquids – Category 2

Acute Tox. 2: Acute toxicity – Category 2

Acute Tox. 4: Acute toxicity – Category 4

Skin Irrit. 2: Skin corrosion/irritation – Category 2

Eye Irrit. 2: Serious eye damage/eye irritation – Category 2

Muta. 1B: Germ cell mutagenicity – Category 1B

Carc. 1A: Carcinogenicity – Category 1A

STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

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**Trade name: Natural Gas Liquids (NGL Mix)**

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STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1

Asp. Tox. 1: Aspiration hazard – Category 1

**Sources**

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Safety Data Sheets, Individual Manufacturers

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