

NATURAL GAS LIQUIDS



Safety Data Sheet

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

Version: 1.1 Revision Date: 05/21/2015

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

Product Identifier

Product Form: Mixture

Product Name: Natural Gas Liquids

Synonyms: NGL, Y-Grade

CAS No. 64741-48-6

Intended Use of the Product

Use of the Substance/Mixture: Feedstock

Name, Address, and Telephone of the Responsible Party

Company

Williams, Inc.
One Williams Center
Tulsa, OK 74172, US
T 800-945-5426
ehs@williams.com

Emergency Telephone Number

Emergency number Chemtrec - 800-424-9300

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

Classification (GHS-US)

| | |
|-------------------|------|
| Flam. Liq. 1 | H224 |
| Skin Irrit. 2 | H315 |
| Asp. Tox. 1 | H304 |
| STOT SE 3 | H336 |
| Carc. 1B, H350 | H350 |
| Aquatic Chronic 2 | H411 |

Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :



GHS02



GHS07



GHS08



GHS09

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- Signal Word (GHS-US)** : Danger
- Hazard Statements (GHS-US)** : H224 – Extremely flammable liquid and vapor
H304 – May contain or release poisonous hydrogen sulfide gas. May be fatal if swallowed and enters airways
H315 – May cause skin corrosion or irritation
H336 – May cause drowsiness or dizziness
H350 – May cause cancer
H411 – Toxic to aquatic life with long lasting effects
- Precautionary Statements (GHS-US)** : 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.
P233 - Keep container tightly closed.
P240 - Ground/bond container and receiving equipment.
P241 - Use with explosion-proof equipment.
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray.
P264 - Wash thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P280 - Wear protective gloves / protective clothing / eye protection / face protection.
P303+P361+P353 - IF ON SKIN: Remove/Take off immediately all contaminated clothing.
P370+P378 - Rinse skin with water/shower. In case of fire: Use dry chemical, carbon dioxide, or foam for extinction.
P313 - If skin irritation occurs: Get medical advice/attention.
P362 - Take off contaminated clothing and wash before reuse.
P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331 - Do NOT induce vomiting.
P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312 - Call a POISON CENTER or doctor/physician if you feel unwell.
P370+P378 - In case of fire: Use dry chemical, carbon dioxide, or foam for extinction.
P403+P235 - Store in a well-ventilated place. Keep cool.
P405 - Store locked up.
P501 - Dispose of contents/container to approved disposal facility.

Other Hazards

Other Hazards Not Contributing to the Classification: Exposure may aggravate those with pre existing eye, skin, or respiratory conditions. Asphyxiant gas, can be fatal. May cause damage to the blood, central nervous system, and cardiovascular system. High concentrations of gas can cause unconsciousness and death.

Unknown Acute Toxicity (GHS-US) Not available

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SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

| NAME | PRODUCT IDENTIFIER | % (W/W) | CLASSIFICATION (GHS-US) |
|--------------------------------------|---------------------|---------|--|
| Natural Gas (petroleum), raw liq mix | (CAS No) 64741-48-6 | 100 | Flam. Liq. 1, H224 Skin Irrit. 2, H315 Asp. Tox. 1, H304 STOT SE 3, H336 Carc. 1B, H350 Aquatic Chronic 2, H411 |

Components

| | | | |
|----------------|-------------------|------|---|
| Propane | (CAS No) 74-98-6 | <40 | Simple Asphy Flam. Gas 1, H220 Liquefied gas, H280 |
| Heptane | (CAS No) 142-82-5 | <30 | Flam. Liq. 1, H224 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 |
| Butane | (CAS No) 106-97-8 | <25 | Simple Asphy Flam. Gas 1, H220 Liquefied gas, H280 |
| 2-Methylbutane | (CAS No) 78-78-4 | <15 | Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 |
| Isobutane | (CAS No) 75-28-5 | <10 | Simple Asphy Flam. Gas 1, H220 Liquefied gas, H280 |
| Ethane | (CAS No) 74-84-0 | < 10 | Simple Asphy Flam. Gas 1, H220 Liquefied gas, H280 |
| Octane | (CAS No) 111-65-9 | <10 | Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 |
| Pentane | (CAS No) 109-66-0 | <10 | Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411 |

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| | | | |
|--|--------------------|----------------------|---|
| n-Hexane | (CAS No) 110-54-3 | <8 | Flam. Liq. 2, H225 Skin Irrit. 2, H315 Repr. 2, H361 STOT SE 3, H336 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411 |
| 2-Methylpentane | (CAS No) 107-83-5 | <6 | Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411 |
| Decane | (CAS No) 124-18-5 | <5 | Flam. Liq. 3, H226 Asp. Tox. 1, H304 |
| Nonane | (CAS No) 111-84-2 | <5 | Skin Corr. 1B: H314 |
| 3-Methylpentane <i>syn: Diethylmethylethane</i> | (CAS No) 96-14-0 | <5 | Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411 |
| 2,2-Dimethylbutane | (CAS No) 75-83-2 | <5 | Flam. Liq. 2;H225, Asp. Tox. 1;H304, Skin Irrit. 2;H315, STOT SE 3;H336, Aquatic Chronic 2;H411 |
| Benzene | (CAS) 71-43-2 | <0.1 - trace amount | Flam. Liq. 2, H225 Acute Tox. 4 (Oral), H302 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Muta. 1B, H340 Carc. 1A, H350 STOT RE 1, H372 Asp. Tox. 1, H304 |
| Hydrogen Sulfide | (CAS No) 7783-06-4 | <0.01 - trace amount | Flam. Gas 1, H220 Liquefied gas, H280 Acute Tox. 2 (Inhalation:gas), H330 Aquatic Acute 1, H400 |

All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

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SECTION 4: FIRST AID MEASURES

Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

Inhalation: If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

Most Important Symptoms and Effects Both Acute and Delayed

Acute: Headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue.

Delayed: Dry skin and possible irritation with repeated or prolonged exposure.

Indication of Any Immediate Medical Attention and Special Treatment Needed: At high concentrations hydrogen sulfide may produce pulmonary edema, respiratory depression, and/or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote, however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of hydrogen sulfide poisoning is confirmed and if the patient does not respond rapidly to supportive care, the use of nitrites may be an effective antidote if delivered within the first few minutes of exposure. For adults the dose is 10 mL of a 3% NaNO₂ solution (0.5 gm NaNO₂ in 15 mL water) I.V. over 2-4 minutes. The dosage should be adjusted in children or in the presence of anemia, and methemoglobin levels, arterial blood gases, and electrolytes should be monitored closely.

Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

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Other Comments: Before attempting rescue, first responders should be alert to the possible presence of hydrogen sulfide, a poisonous gas with the smell of rotten eggs, and should consider the need for respiratory protection (see Section 8). Remove casualty to fresh air as quickly as possible. Immediately begin artificial respiration if breathing has ceased. Consider whether oxygen administration is needed. Obtain medical advice for further treatment.

SECTION 5: FIREFIGHTING MEASURES

NFPA 704 Hazard Class

Health: 1 Flammability: 4 Instability: 0



0 (Minimal)
1 (Slight)
2 (Moderate)
3 (Serious)
4 (Severe)

Unusual Fire & Explosion Hazards: Extremely flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire. Hazardous combustion/decomposition products, including hydrogen sulfide, may be released by this material when exposed to heat or fire. Use caution and wear protective clothing, including respiratory protection.

Extinguishing Media

Suitable Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Unsuitable Extinguishing Media: Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Extremely flammable gas

Explosion Hazard: May form flammable/explosive vapor-air mixture. Heating may cause an explosion. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

Reactivity: Hazardous reactions will not occur under normal conditions.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire

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Firefighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Smoke, carbon oxides (CO, CO₂), hydrocarbons, sulfur oxides, nitrogen oxides.

Other information: Do not allow run-off from fire fighting to enter drains or water courses.

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Extremely flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. May contain or release poisonous hydrogen sulfide gas. If the presence of dangerous amounts of H₂S around the spilled product is suspected, additional or special actions may be warranted, including access restrictions and use of protective equipment.

Action To Be Taken For Spills: Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons downwind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Ventilate area.

Environmental Precautions

Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

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Methods and Material for Containment and Cleaning Up

For Containment: Notify authorities if liquid enters sewers or public waters. Use only non-sparking tools.

Methods for Cleaning Up: Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Additional Hazards When Processed: Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Non-sparking tools should be used. May contain or release dangerous levels of hydrogen sulfide. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing vapors or mists. Use only outdoors or in well-ventilated area.

Extremely Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

Static Accumulation Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding of tanks, transfer piping, and storage tank level floats are necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. Special care should be given to ensure that special slow load procedures for "switch loading" are followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such as gasoline or naphtha). For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8). Do not eat, drink or smoke when using this product.

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Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Proper grounding procedures to avoid static electricity should be followed. Comply with applicable regulations.

Storage Conditions: This material may contain or release poisonous hydrogen sulfide gas. In a tank, barge, or other closed container, the vapor space above this material may accumulate hazardous concentrations of hydrogen sulfide. Check atmosphere for oxygen content, H₂S, and flammability prior to entry. Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA.

Incompatible Materials: Strong oxidizers, strong acids, strong bases, halogens, chlorine.

Specific End Use(s): Feedstock.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

| Chemical Name | ACGIH | OSHA |
|--------------------------------------|-----------------------------------|---|
| Natural Gas (petroleum), raw liq mix | TWA: 300 ppm (as gasoline) | TWA: 400 mg/m ³ TWA: 100 ppm |
| Propane | TWA: 1000 ppm | TWA: 100 ppm TWA: 1800 mg/m ³ |
| Heptane | STE:: 500 ppm TWA: 400 ppm | 1926.55 – TWA: 500 ppm 1926.55 – TWA: 2000 mg/m ³ |
| Butane | TWA: 1000 ppm | -- |
| 2-Methylbutane (isopentane) | TWA: 600 ppm | -- |
| Isobutane | STEL: 1000 ppm | -- |
| Ethane | Minimal oxygen content - asphyxia | 1926.55 - Simple asphyxiant |
| Octane | TWA: 300 ppm | <10 |
| Pentane | TWA: 1000 ppm | TWA: 1000 ppm TWA: 2950 mg/m ³ |
| n-Hexane | TWA: 50 ppm Skin | TWA: 500 ppm TWA: 1800 mg/m ³ |
| 2-Methylpentane | TWA: 1000 ppm | TWA: 1000 ppm TWA: 2950 mg/m ³ |
| Decane | -- | -- |
| Nonane | TWA: 200 ppm | -- |
| 3-Methylpentane | STEL: 1000 ppm TWA: 500 | -- |

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| | | |
|--------------------|---------------------------------------|---|
| 2,2-Dimethylbutane | STEL: 1000ppm TWA: 500 PPM | -- |
| Benzene | STEL: 2.5 ppm TWA: 0.5 ppm Skin | Ceiling: 25 ppm STEL: 5 ppm TWA 1 ppm |
| Hydrogen Sulfide | STEL: 5 ppm TWA: 1 ppm | 1910.1000 - Ceiling: 20 ppm 1926.55 - TWA: 15 mg/m ³ 1926.55 - TWA: 10 ppm |

Note: State province, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Exposure Controls

Appropriate Engineering Controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required. Gas detectors should be used when flammable gases/vapours may be released. Ensure adequate ventilation, especially in confined areas. Proper grounding procedures to avoid static electricity should be followed. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use explosion-proof equipment.

Personal Protective Equipment: Protective goggles. Protective clothing. Respiratory protection of the dependent type. Insulated gloves.



Materials for Protective Clothing: Chemically resistant materials and fabrics. Wear fire/flame resistant/retardant clothing.

Hand/Skin Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile.

Eye Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Respiratory Protection: A NIOSH approved, self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode should be used in situations of oxygen deficiency (oxygen content less than 19.5 percent), unknown exposure concentrations, or situations that are immediately dangerous to life or health (IDLH).

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use.

If benzene concentrations equal or exceed applicable exposure limits, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028 - Benzene).

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Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Other Information: When using, do not eat, drink or smoke.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

| | |
|--|--|
| Physical State | : Liquid |
| Appearance | : Colorless |
| Odor | : Gasoline; Rotton egg / sulfurous |
| pH | : Not applicable |
| Relative Evaporation Rate (Air=1) | : Not available |
| Melting Point | : Not available |
| Freezing Point | : Not available |
| Boiling Point | : Not available |
| Flash Point | : -73 °C (-99 °F) |
| Auto-ignition Temperature | : Not available |
| Decomposition Temperature | : Not available |
| Percent Volatile | : 100% |
| Flammability (solid, gas) | : Extremely flammable gas |
| Lower Flammable Limit | : Not available |
| Upper Flammable Limit | : Not available |
| Vapor Pressure | : 150-200 psia (Reid VP) 37.8 °C (100 °F) |
| Relative Vapor Density at 20 °C | : > 1 (air = 1) |
| Specific Gravity (water=1) | : (estimated) 0.5-0.7 @20°C (68°F) |
| Solubility in Water | : Negligible |
| Explosion Data – Sensitivity to Mechanical Impact | : No |
| Explosion Data – Sensitivity to Static Discharge | : Static Discharge could act as an ignition source |

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SECTION 10: STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

| Acute Toxicity | Hazard | Additional Information | LC50/LD50 Data |
|--------------------------------|---|---|--------------------|
| Inhalation: | Expected to have a low degree of toxicity by inhalation | May contain or release poisonous hydrogen sulfide gas see Other Comments | > 5.2 mg/L (vapor) |
| Skin Absorption: | Unlikely to be harmful | | > 2 g/kg |
| Ingestion (Swallowing): | Unlikely to be harmful | | > 5 g/kg |

Aspiration Hazard: May be fatal if swallowed and enters airways.

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Signs and Symptoms: Effects of overexposure can include slight irritation of the respiratory tract, nausea, vomiting, and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue). Continued exposure to high concentrations can result in vomiting, cardiac irregularities and sudden loss of consciousness.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: Not classified

Specific Target Organ Toxicity (Single Exposure): May cause drowsiness and dizziness.

Specific Target Organ Toxicity (Repeated Exposure): Not expected to cause organ effects from repeated exposure.

Carcinogenicity: May cause cancer Based on component information.

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: Not expected to cause reproductive toxicity.

Information on Toxicological Effects - Ingredient(s)

Natural gas (petroleum), raw liq. mix

Carcinogenicity: Two year inhalation studies of vaporized unleaded gasoline produced an increased incidence of kidney tumors in male rats and liver tumors in female mice. Repeated skin application of various petroleum naphthas in mice for two years resulted in an increased incidence of skin tumors but only in the presence of severe skin irritation. Follow-up mechanistic studies suggest that the occurrence of these tumors may be the consequence of promotional processes and not relevant to human risk assessment. Epidemiology data collected from a study of more than 18,000 petroleum

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marketing and distribution workers showed no increased risk of leukemia, multiple myeloma, or kidney cancer from gasoline exposure. Unleaded gasoline has been identified as a possible carcinogen by the International Agency for Research on Cancer.

Target Organs: Two year inhalation studies of wholly vaporized unleaded gasoline, and 90 days studies of various petroleum naphthas, did not produce significant target organ toxicity in laboratory animals. Nephropathy in male rats, characterized by the accumulation of alpha-2-u-globulin in epithelial cells of the proximal tubules was observed, however follow-up studies suggest that these changes are unique to the male rat.

Reproductive Toxicity: No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to high vapor concentrations of unleaded gasoline and petroleum naphthas via inhalation. A two-generation reproductive toxicity study of vapor recovery gasoline did not adversely affect reproductive function or offspring survival and development.

n-Hexane

Target Organs: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

Reproductive Toxicity: Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Benzene

Carcinogenicity: Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by IARC, the US National Toxicology Program and the US Occupational

Safety and Health Administration.

Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Reproductive Toxicity: Some studies in occupationally exposed women have suggested benzene exposure increased risk of miscarriage and stillbirth and decreased birth weight and gestational age. The size of the effects detected in these studies was small, and ascertainment of exposure and outcome in some cases relied on self-reports, which may limit the reliability of these results

Germ Cell Mutagenicity: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells. Exposure has also been associated with chromosomal aberrations in sperm cells in human and animal studies.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity: Acute aquatic toxicity studies on samples of gasoline and naphtha streams show acute toxicity values greater than 1 mg/L and mostly in the range 1-100 mg/L. These tests were carried out on water accommodated fractions, in closed systems to prevent evaporative loss. Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition. These substances should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment. Classification: H411; Chronic Cat 2.

Persistence and Degradability: The hydrocarbons in this material are not readily biodegradable but are regarded as inherently biodegradable since their hydrocarbon components can be degraded by microorganisms.

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Persistence per IOPC Fund definition: Non-Persistent

Bioaccumulative Potential: Log Low values measured for the hydrocarbon components of this material range from 3 to greater than 6 and therefore are regarded as having the potential to bioaccumulate. In practice, metabolic processes or physical properties may prevent this effect or limit bioavailability.

Mobility in Soil: On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilization to air. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half-lives varying from 6.5 days for benzene to 0.5 days for n-dodecane.

Other Adverse Effects: None anticipated.

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the SDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Additional Information: Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic
- D018 - Toxicity characteristic (Benzene)

SECTION 14: TRANSPORT INFORMATION

U.S. Department of Transportation (DOT)

| | |
|-------------------------------------|---|
| Shipping Description | : <i>If vapor pressure is > 300 kPa (43.5 psia) at 50° C (122° F) shipping description is:</i> UN1965, Hydrocarbon gas mixture, liquefied, n.o.s., 2.1; <i>If vapor pressure is <= 300 kPa (43.5 psia) at 50° C (122° F) shipping description is:</i> UN3295, Hydrocarbons, liquid, n.o.s., 3, I or II [I if BP < 95° F (35° C); II if BP > 95° F] |
| Non-Bulk Package Marking | : <i>Must be consistent with shipping description, either:</i> Hydrocarbon gas mixture, liquefied, n.o.s., UN1965 <i>or</i> Hydrocarbons, liquid, n.o.s., UN3295 |
| Non-Bulk Package Labeling | : <i>For UN1965:</i> Flammable gas <i>For UN3295:</i> Flammable liquid |
| Bulk Package/Placard Marking | : <i>For UN1965:</i> Flammable gas / 1965 <i>For UN3295:</i> Flammable / 3295 |

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- Packaging - References** : **For UN1965:** 49 CFR: 173.306; 173.304; 173.314 & .315
For UN3295: 49 CFR 173.150; 173.201; 173.243 [**PG I**]
or
49 CFR 173.150; 173.202; 173.242 [**PG II**]
(Exceptions; Non-bulk; Bulk)
- Hazardous Substance** : See Section 15 for RQ`s
- Emergency Response Guide** : **UN1965** - 115; **UN3295** - 128;
- Note** : **Other shipping description elements may be required for DOT compliance.**

International Maritime Dangerous Goods (IMDG)

- Shipping Description:** : **If boiling point is < 20° C shipping description is:**
UN1965, Hydrocarbon gas mixture, liquefied, n.o.s., (Propane , Butane), 2.1
If vapor pressure is <= 300 kPa (43.5 psia) at 50° C (122° F) shipping description is:
UN3295, Hydrocarbons, liquid, n.o.s., 3, I **or** II (FP° C cc), [where FP is the material's flash point in degrees C cc.]
[I if BP < 95° F (35° C); II if BP > 95° F]
- Non-Bulk Package Marking** : **Must be consistent with shipping description, either:**
Hydrocarbon gas mixture, liquefied, n.o.s., (Propane, Butane), UN1965
or
Hydrocarbons, liquid, n.o.s., UN3295
- Labels** : **For UN1965:** Flammable gas
For UN3295: Flammable liquid
- Placards/Marking (Bulk)** : **For UN1965:** Flammable gas / 1965
For UN3295: Flammable / 3295
- Packaging - Non-Bulk** : **For UN1965:** P200
For UN3295: P001
- EMS** : **For UN1965:** F-D, S-U
For UN3295: F-E, S-D
- Note** : **If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.**

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

- UN/ID #** : UN1965 **or** UN3295
- Proper Shipping Name** : **For UN1965:** Hydrocarbon gas mixture, liquefied, n.o.s. (Propane, Butane)
For UN3295: Hydrocarbons, liquid, n.o.s.
- Hazard Class/Division** : **For UN1965:** 2.1
For UN3295: 3
- Subsidiary risk** : None
- Packing Group** : **For UN1965:** None
For UN3295: I **or** II [**Determined by IATA 3.3.2**]

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- Non-Bulk Package Marking** : **For UN1965:** Hydrocarbon gas mixture, liquefied, n.o.s. (Propane, Butane), UN1965
For UN3295: Hydrocarbons, liquid, n.o.s., UN3295
- Labels** : **For UN1965:** Flammable gas , Cargo Aircraft Only
For UN3295: Flammable liquid
- ERG Code** : **For UN1965:** 10L **or For UN3295:** 3H

| | LTD Qty | Passenger Aircraft | Cargo Aircraft Only |
|-----------------------------------|---|--|---|
| Packaging Instruction #: | UN1965 – Forbidden UN3295 - Forbidden - [PG I] Y341 - [PG II] | UN1965 – Forbidden UN3295 - 351 - [PG I] 353 - [PG II] | UN1965 – 200 UN3295 - 361 - [PG I] 64 - [PG II] |
| Max. Net Qty. Per Package: | UN3295 - Forbidden - [PG I] 1L - [PG II] | UN3295 - 1L - [PG I] 5 L - [PG II] | UN1965 - 150 kg UN3295 - 30 L - [PG I] 60 L - [PG II] |

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

| Component | TPQ | EPCRA RQ |
|------------------|--------|----------|
| Hydrogen Sulfide | 500 lb | 100 lb |

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

| | |
|-------------------------------|-----|
| Acute Health Hazard: | Yes |
| Chronic Health Hazard: | Yes |
| Fire Hazard: | Yes |
| Pressure Hazard: | No |
| Reactive Hazard: | No |

CERCLA/SARA - Section 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

| Component | Concentration | de minimis |
|-----------|---------------|------------|
| n-Hexane | 5-25 | 1% |
| Benzene | 0.1-5 | .01% |

EPA (CERCLA) Reportable Quantity (in pounds):

EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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International Hazard Classification

Canada:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

WHMIS Hazard Class:

B2 - Flammable Liquids

D2A

D2B

National Chemical Inventories

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA

All components are either on the DSL, or are exempt from DSL listing requirements

U.S. Export Control Classification Number: EAR99

SECTION 16: OTHER INFORMATION

Revision date : 05/21/2015

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200

GHS Full Text Phrases:

| | |
|----------------------------------|--|
| Acute Tox. 4 (Oral) | Acute toxicity (oral) Category 4 |
| Acute Tox. 4 (Inhalation: vapor) | Acute toxicity (inhalation: vapor) Category 4 |
| Aquatic Acute 1 | Hazardous to the aquatic environment - Acute Hazard Category 1 |
| Aquatic Acute 2 | Hazardous to the aquatic environment - Acute Hazard Category 2 |
| Aquatic Chronic 1 | Hazardous to the aquatic environment - Chronic Hazard Category 1 |
| Aquatic Chronic 2 | Hazardous to the aquatic environment - Chronic Hazard Category 2 |
| Aquatic Chronic 3 | Hazardous to the aquatic environment - Chronic Hazard Category 3 |
| Asp. Tox. 1 | Aspiration hazard Category 1 |
| Carc. 1A | Carcinogenicity Category 1A |
| Carc. 1B | Carcinogenicity Category 1B |
| Eye Irrit. 2A | Serious eye damage/eye irritation Category 2A |
| Flam. Gas 1 | Flammable gases Category 1 |
| Flam. Liq. 1 | Flammable liquids Category 1 |
| Flam. Liq. 2 | Flammable liquids Category 2 |
| Flam. Liq. 3 | Flammable liquids Category 3 |
| Muta. 1B | Germ cell mutagenicity Category 1B |

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| | |
|---------------|---|
| Repr. 2 | Reproductive toxicity Category 2 |
| Simple Asphy | Simple Asphyxiant |
| Skin Irrit. 2 | Skin corrosion/irritation Category 2 |
| STOT RE 1 | Specific target organ toxicity (repeated exposure) Category 1 |
| 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 |
| H226 | Flammable liquid and vapor |
| H280 | Contains gas under pressure; may explode if heated |
| H302 | Harmful if swallowed |
| H304 | May be fatal if swallowed and enters airways |
| H312 | Harmful in contact with skin |
| H315 | Causes skin irritation |
| H319 | Causes serious eye irritation |
| H330 | Fatal if inhaled |
| H332 | Harmful if inhaled |
| H336 | May cause drowsiness or dizziness |
| H340 | May cause genetic defects |
| H350 | May cause cancer |
| H361 | Suspected of damaging fertility or the unborn child |
| H372 | Causes damage to organs through prolonged or repeated exposure |
| H373 | May cause damage to organs through prolonged or repeated exposure |
| H400 | Very toxic to aquatic life |
| H401 | Toxic to aquatic life |
| H410 | Very toxic to aquatic life with long lasting effects |
| H411 | Toxic to aquatic life with long lasting effects |
| H412 | Harmful to aquatic life with long lasting effects |

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Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

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