

January 28, 2009

Chemtane Energy LLC

1905 N Battlebell
Highlands, TX 77562

CHEMTANE 2 BLENDED in PROPANE MSDS (MATERIAL SAFETY DATA SHEET)

Phone numbers: Voice (281) 424-8787 Spill Chemtrec (800) 424-9300
Fax (281) 424-9349 (202) 483-7616 24 hr.

1. *Identification of the substance/preparation and of the company/undertaking*

Chemtane 2 in Propane / Formulated by Chemtane Energy LLC (See contact info above)

Person responsible for placing product on market: Raymond Davis 800-776-1485; Cell 281 382-1062
P.O. Box 2210
Baytown, Texas 77522
USA

Contact in EU: inmasegarra@gdaparatos.com

MSDS preparation: James Boucher jboucher@chemtane2.com

Health Emergency Toll Free 800-776-1485 (During office hours.) See numbers above for Spill.

Emergency phone: National Institute of Toxicology: 0034915628469

2. *Hazards Identification*

Extremely Flammable Liquid and Vapor
LIQUID CAN CAUSE SKIN AND EYE INJURY
MAY EXCLUDE OXYGEN AVAILABLE FOR BREATHING
MAY NOT GIVE LEAK DETECTION BY SENSE OF SMELL
CONTENTS UNDER PRESSURE

Hazardous in case of ingestion; Aspiration hazard if swallowed

Eye: Liquid or vapors may be mildly irritating.

Skin: prolonged or repeated contact with the liquid may cause defatting of the skin resulting in drying, redness, and possibly blistering.

Inhalation: Vapors may be irritating to lungs and mucous membranes of the nose and throat.

Overexposure may cause dizziness, headache, excitation, drowsiness, loss of coordination, anesthesia, unconsciousness, and reparatory arrest. Exposure to Chemtane V in concentrations of 500 ppm for ten minutes was found not to be irritating to the mucous membranes or to produce local or systematic effects in humans.

Ingestion: May cause effects similar to those of inhalation and gastrointestinal irritation. If swallowed, may be aspirated resulting in inflammation and possible fluid accumulation in the lungs.

Chronic: Prolonged or repeated skin contact may cause dermatitis.

Target Organs: Central nervous system, liver, lungs.

3. **Composition/Information on Ingredients**

Ingredients Name	EINECS Number	CAS Number	OSHA PEL	Index No.
Propane (>96%)	200-827-9	74-98-6	1000 ppm	601-003-00-5
Soltrol 10	70024-92-9	70024-92-9	NE	
Cyclopentane	206-016-6	287-92-3	600 ppm	
n-Pentane	203-692-4	109-66-0	600 ppm	
2-Methylpentane	203-523-4	107-83-5	500 ppm	
Isopentane	201-142-8	78-78-4	NE	
2,3-Dimethylbutane	201-193-6	79-29-8	500 ppm	
Isohexanes	232-443-2	8030-30-6	NE	
2-Propanol	200-661-7	67-63-0	500 ppm	

4. **First-Aid Measures**

FIRST AID AND EMERGENCY PROCEDURES:

Eye: Flush eyes with running water for at least fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Skin: Wash skin with soap and water. If irritation or adverse symptoms develop, seek medical attention.

Inhalation: Remove from exposure. If breathing is difficult, give oxygen. If breathing ceases, administer artificial respiration followed by oxygen. Seek immediate medical attention.

Ingestion: Do not induce vomiting. Seek immediate medical attention.

NOTE TO PHYSICIAN: Gastric lavage using a cuffed endotracheal tube may be performed at your discretion.

5. **Fire-Fighting Measures**

Flash Point -150°F (-101°C) LEL 2.3% UEL 9.4%

EXPLOSIVE LIMITS: (% by volume in Air) : LEL 2.3% UEL 9.4%

FIRE EXTINGUISHING MEDIA: Dry chemical, foam or carbon dioxide (CO₂)

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate area of all unnecessary personnel. Use NIOSH/MSHA approved self-contained breathing apparatus and other protective equipment and/or garments described in Section C if exposure conditions warrant. Shut off source. Water fog or spray to cool exposed containers and equipment. Do not spray water directly on fire. Product will float and could be reignited on surface of water.

FIRE AND EXPLOSION HAZARDS: Carbon oxides formed when burned. Highly flammable vapors which are heavier than air may accumulate in low areas and/or spread along ground away from handling site. Flash back along vapor trail is possible.

Unusual Fire and Explosion Hazards pressurized containers can present explosion hazard in fire.

High volatility, heavier than air.

6. **Accidental Release Measures**

Precautions Required if Material is Released or Spilled:

Evacuate area of all unnecessary personnel. Wear Protective equipment and/or garments described in Section C if exposure conditions warrant. Shut off source if possible and contain spill. Protect from ignition. Keep out of water sources and sewers.

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area and protect people.

Adequate fire protection must be provided. Minimum Personal Protective Equipment should be Level B: fire-retardant protective clothing, mechanically-resistant gloves and Self-Contained Breathing Apparatus. Use only non-sparking tools and equipment. Locate and seal the source of the leaking gas. Protect personnel attempting the shut-off with water-spray. Allow the gas to dissipate. Monitor the surrounding area for combustible gas levels, and oxygen. Combustible gas concentration must be below 10% of the LEL of Propane (see Section 5, Fire-Fighting Measures) prior to entry of response personnel. The atmosphere must contain components below levels listed in Section 2 (Composition and Information on Ingredients) and have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there.

7. **Handling and Storage**

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this gas mixture IN YOU. Do not eat or drink while handling chemicals. Be aware of any signs of overexposure [See Section 3 (Hazard Identification)], because overexposure to fatal concentrations of this product could occur without any significant warning symptoms.

STORAGE AND HANDLING PRACTICES: Cylinders should be stored in dry, well-ventilated areas away from sources of heat. Compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits. Post “No Smoking or Open Flames” signs in storage or use areas.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Protect cylinders against physical damage. Store in cool, dry, well-ventilated, fireproof area, away from flammable materials and corrosive atmospheres. Store away from heat and ignition sources and out of direct sunlight. Do not store near elevators, corridors or loading docks. Avoid storing products by incompatible chemicals. Do not store containers where they can come into contact with moisture. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Never tamper with pressure relief devices in valves and cylinders. Cylinders should be separated from oxygen cylinders, or other oxidizers, by a minimum distance of 20 ft., or by a barrier of non-combustible material at least 5 ft. high, having a fire-resistance rating of at least 0.5 hours. Isolate from other incompatible chemicals (refer to Section 10, Stability and Reactivity). Storage areas must meet national electrical codes for Class 1 Hazardous Areas. Post “No Smoking or Open Flames” signs in storage or use areas. Consider installation of leak detection and alarm for storage and use areas. Have appropriate extinguishing equipment in the storage area (i.e. sprinkler system, portable fire extinguishers).

The following rules are applicable to situations in which cylinders are being used:

Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap in-place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Replace valve protection cap. Mark empty cylinders “EMPTY”.

NOTE: Use only DOT or ASME Code containers. Earth-ground and bond all lines and equipment associated with this product. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, *Safe Handling of Compressed Gases in Containers*. Additionally, refer to CGA Bulletin SB-2 “Oxygen Deficient Atmospheres”.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

8. **Exposure Controls / Personal Protection**

Ventilation and engineering controls: Use with adequate ventilation to ensure compliance with exposure limits described in Section 3 (Composition /Information on Ingredients). Local exhaust ventilation is preferred, because it prevents dispersion of this gas mixture into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the levels of flammable gas, and oxygen.

Respiratory protection: Maintain Oxygen levels above 19.5% in the workplace. If respiratory protection is needed, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required

Eye protection: Splash goggles, face-shields or safety glasses.

Hand protection: Wear mechanically-resistant gloves when handling cylinders of this product. If use of this gas mixture involves the use of other chemicals, wear gloves appropriate for those materials.

Body protection: Use body protection appropriate for task. Cotton clothing is recommended to prevent static electric build up. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection.

9. **Physical and Chemical Properties**

Boiling Point -42 °C (- 43.6 °F)

Specific Gravity (H₂O = 1) at 25°C (77°F) and 1 atm: 0.5077

Specific Gravity (Air = 1) at 21.1°C (70°F) and 1 atm: 1.523

Vapor Density at 21.1°C (70°F) and 1 atm: 0.2612 lb/ft³ (4.183 kg/m³)

Vapor Pressure 218 PSI @ 37.78 °C ; 110 PSI @ 21.1 °C

Evaporation Rate (Butyl Acetate = 1) 1.00

Solubility in Water Not Soluble

Appearance is Colorless Gas

Odor – Faint unpleasant Odor

Gas at Standard Temperature and Pressure (STP)

Freezing Point at 1 atm: -187.69°C (-305.84°F)

Flash Point (test method): -104°C (-156°F) TCC

Flammable

Flammable Limits in Air, % by volume: LOWER: 2.1% UPPER: 9.5%

Solubility in Water @ 20°C (68°F): 0.065

Autoignition Temperature: 450°C (842°F)

Molecular Weight: 44.096

Molecular Formula: C₃H₈

10. **Stability and Reactivity**

Stability: Stable

Incompatibility (Materials to Avoid): oxygen and strong oxidizing agents

Hazardous Polymerization: Will Not Occur

Conditions to Avoid: Avoid exposing cylinders to extremely high temperatures, which could cause the cylinders to rupture. Avoiding exposing this gas mixture to incompatible chemicals.

Hazardous Decomposition Products: Carbon oxides formed when burned.

11. Toxicological Information

Toxicity data: The following data are for Propane component of this mixture.

All other components are in less than 1% concentration.

PROPANE.

Skin Contact (Rabbit): Several formulations containing an isobutane-propane mixture were tested for skin irritation effects. All formulations contained less than 13% propane. All of the formulations containing propane caused only mild irritation.

Effects on Short-Term Inhalation: Guinea-pigs breathing 5.5% propane by volume developed tremors after 5 minutes. Nausea, retching, and stupefaction were observed when animals were exposed for 30-120 minutes. All the animals survived a two-hour exposure and had no significant tissue damage. A gas concentration of 89% did not cause anesthesia, but depressed the blood pressure of cats. Inhalation of 10 percent propane by mice and 15% by dogs cause weak cardiac sensitization, Presumably, all of these effects are reversible when exposure ceases. In primates, 10% propane caused some change in heart function. At 20% there was aggravation of these symptoms and respiratory depression.

Effects of Long-Term Inhalation: No toxicity or abnormalities were observed when monkeys were exposed to approximately 750 ppm for 90 days. Similar results were obtained when monkeys were exposed to an aerosol spray containing 65% propane and isobutane.

Suspected cancer agent: The components of this gas mixture are not found on the following lists: U.S. FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC, and therefore are not considered to be, nor suspected to be cancer-causing agents by these agencies.

Irritancy of product: Prolonged contact may result in mild irritation of the skin. Contact with rapidly expanding gases can cause frostbite and damage to exposed skin and eyes.

Sensitization of product: The components of this gas mixture are not human skin or respiratory sensitizers. The Propane component of this gas is considered to be a weak cardiac sensitizer, based on animal testing.

Reproductive toxicity information: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: This product is not reported to cause mutagenic effects in humans.

Embryotoxicity: This product is not reported to cause embryotoxic effects in humans.

Teratogenicity: This product is not reported to cause teratogenic effects in humans.

Reproductive Toxicity: This product is not reported to cause adverse reproductive effects in humans.

12. Ecological Information

Environmental stability: This gas mixture will be dissipated rapidly in well-ventilated areas.

Effect of material on plants or animals: Due to the gaseous nature of this mixture, no adverse effect is expected in animal and plant, except frost produced in the presence of rapidly expanding gases may adversely affect plant life.

Effect of chemical on aquatic life: No evidence is currently available on the effects of this gas mixture on aquatic life.

Floats on top of water. Specific Gravity (H₂O = 1): 0.63 at 15.6/15.6°C (60/60°F)

Does and not readily contaminate groundwater.

13. Disposal Considerations

Disposal by incineration is acceptable.

Waste Disposal (Insure Conformity with all Applicable Disposal Regulations): Incinerate or otherwise manage empty damaged cylinders at a permitted waste management facility.

14. Transport Information

DOT IDENTIFICATION NUMBER UN1978

DOT Hazard Class 2

Road and train classification

(TPC/ADR/TPF/RID): 23

Road and train transport hazard label

(TPC/ADR/TPF/RID): 2.1

FLAMMABLE GAS

15. Regulatory Information

Labelling of containers:

Pictogram:



F+ Extremely flammable

Risk sentence: R12 Extremely flammable

Safety sentences: S2: Keep away from children

S9: Store and use with adequate ventilation

S16: Keep away from flames or sparks. Do not smoke

S33: Avoid electrostatic charges.

Follow Home regulations regarding:

Labour code

Classified installations

Habitable places

Public premises

Very high buildings

16. Other Information

this MSDS has been prepared according to directive 91/155/CEE (J.O. N° L76 del 22.03.91,p.35) modified by REACH directive

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