



MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name Propane with Odorant / HD-5
Version # 01
Revision date 06-02-2010
CAS # Mixture
Product use Consumer grade fuel
Manufacturer/Supplier Devon US Operations
20 North Broadway
Oklahoma City, OK 73102-8260
Telephone: (405) 235-3611
-
Devon Canadian Operations
Calgary, AB. T2P 4H2
2000, 400 – 3rd Avenue SW.
Telephone: (403) 232-7100

Emergency Emergency Chemtrec:
Within the USA (800) 424-9300
Outside the USA (703) 527-3887
Devon Canada Emergency Phone:
(403) 232-7100

2. Hazards Identification

Physical state Gas.
Appearance Gas under normal atmospheric conditions; liquid under pressure.
Emergency overview DANGER

Extremely flammable gas - may cause flash fire. Contents under pressure. Vapors may cause flash fire or explosion. Will be easily ignited by heat, spark or flames. Containers may explode when heated.

OSHA regulatory status This preparation is classified as dangerous according to Directive 1999/45/EC and its amendments. This product is hazardous according to OSHA 29CFR 1910.1200.

Potential health effects

Routes of exposure

Inhalation.

Eyes

Direct contact with concentrated gas may cause minor irritation. Pressurized gas can cause mechanical injury to the eye.

Skin

Not likely to cause a problem due to high volatility of the product. Contact with rapidly expanding gas may cause burns or frostbite.

Inhalation

This product is an asphyxiant gas which can cause unconsciousness/death if OXYGEN levels are sufficiently reduced. In high concentrations, vapors are narcotic and may cause headache, fatigue, dizziness and nausea.

Ingestion

This material is a gas under normal atmospheric conditions and ingestion is unlikely.

Target organs

Central nervous system.

Chronic effects

May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion, and blurred vision) and/or damage.

Signs and symptoms

Narcosis. Decrease in motor functions.

Potential environmental effects

The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Propane	74-98-6	90-95
Ethane	74-84-0	0-5

Propylene	115-07-1	0-5
Ethyl Mercaptan	75-08-1	<0.1

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

4. First Aid Measures

First aid procedures

Eye contact In case of contact, immediately flush eyes with fresh water for at least 15 minutes while holding the eyelids open. Remove contact lenses if worn. Get medical attention if irritation persists.

Skin contact Not expected to be absorbed through the skin but may cause slight irritation. High pressure injection through the skin requires immediate medical attention. Treat frostbite area of skin by immersing the affected area in warm water (between 100F/38C and 110F/43C, not exceeding 112F/44C). Keep immersed for 20 to 40 minutes. Seek medical assistance.

Inhalation Move injured person into fresh air and keep person calm under observation. If breathing is difficult, give oxygen. Get medical attention if any discomfort occurs.

Ingestion This material is a gas under normal atmospheric conditions and ingestion is unlikely.

Notes to physician Provide general supportive measures and treat symptomatically.

General advice Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties Extremely flammable gas. Gas forms mixtures with air which can catch fire and burn with explosive violence. Vapors are heavier than air and invisible mixture spreads easily and may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Extinguishing media

Suitable extinguishing media Extinguish with carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media Not applicable.

Protection of firefighters

Specific hazards arising from the chemical Fire may produce irritating, corrosive and/or toxic gases.

Protective equipment and precautions for firefighters Do not extinguish fires unless gas flow can be stopped safely; explosive re-ignition may occur. Promptly isolate the scene by removing all persons from the vicinity of the incident. No action shall be taken involving any personal risk or without suitable training. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus. Stop flow of material. Use water to keep fire exposed containers cool and to protect personnel effecting shutoff. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop leak. Prevent runoff from fire control or dilution from entering streams, sewers or drinking water supply.

Special protective equipment for fire-fighters Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with full face-piece operated in positive pressure mode. Use approved gas detectors in confined spaces.

Specific methods In the event of fire and/or explosion do not breathe fumes. Evacuate area. Check oxygen content before entering area. Water spray should be used to cool containers. Remove pressurized gas cylinders from the immediate vicinity. Turn leaking cylinder with the leak up to prevent escape of gas in liquid state. Containers can burst violently when heated, due to excess pressure build-up.

Hazardous combustion products Carbon monoxide and carbon dioxide.

6. Accidental Release Measures

Personal precautions Eliminate all sources of ignition in vicinity of released vapors. Evacuate all non-essential personnel to an area upwind. Stop leak if possible without any risk. Ventilate enclosed areas to prevent formation of toxic, flammable or oxygen deficient atmospheres. Water spray may be used to reduce vapors. Avoid vapor cloud even with proper respiratory protective equipment. Use suitable protective equipment (section 8). Follow all fire-fighting procedures (section 5).

Environmental precautions	Prevent further leakage or spillage if safe to do so. Prevent material from entering drains, sewers or low lying areas. See section 13 for waste disposal information.
Methods for containment	Stop leak if you can do so without risk. Prevent entry into waterway, sewers or confined areas.
Methods for cleaning up	Stop the flow of gas. Allow to dissipate with adequate ventilation.
Other information	These gases may be used as an auxiliary fuel or disposed of by burning in a properly designed flare or incinerator in accordance with federal or local requirements.

7. Handling and Storage

Handling	Put on appropriate personal protective equipment (see section 8). Special precautions should be taken when entering or handling equipment in this type of gas service because of possible radioactive contamination. All equipment should be checked for radioactivity or opened to the atmosphere and have forced ventilation applied for at least 4 hours prior to entry or handling. Avoid direct skin contact with any surface. Avoid generation of dust, smoke, fumes, etc. in the work area, or if they cannot be avoided, a tested and certified radionuclide dust respirator should be worn. Smoking, eating, or drinking should be prohibited when working with the equipment. Employees should wash thoroughly with soap and water and discard contaminated clothing after entering or handling the equipment. Workers should wash hands and face before eating, drinking and smoking. Do not breathe gas it contains hydrogen sulfide, benzene and n-hexane. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter enclosed areas and confined space unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Pumping and transferring operations must be electrically grounded and bonded to dissipate static build up.
Storage	Keep away from heat, spark, and open flame. Store storage containers in cool, well-ventilated areas away from direct sunlight, heat or flame. Thoroughly test gas lines for leakage before use, especially in confined spaces. Store away from strong oxidizing materials. Gas containing hydrogen sulfide may accumulate during storage and transport. Vapors containing benzene may accumulate during storage or transport.

8. Exposure Controls / Personal Protection

Occupational exposure limits

ACGIH

Components	Type	Value
Ethane (74-84-0)	TWA	1000 ppm
Ethyl Mercaptan (75-08-1)	TWA	0.5 ppm
Propane (74-98-6)	TWA	1000 ppm
Propylene (115-07-1)	TWA	500 ppm

U.S. - OSHA

Components	Type	Value
Ethyl Mercaptan (75-08-1)	Ceiling	25 mg/m3
		10 ppm
	TWA	0.5 ppm
Propane (74-98-6)		1 mg/m3
	PEL	1000 ppm
	TWA	1800 mg/m3 1800 mg/m3 1000 ppm

Canada - Alberta

Components	Type	Value
Ethane (74-84-0)	TWA	1000 ppm
Ethyl Mercaptan (75-08-1)		0.5 ppm
		1.3 mg/m3
Propane (74-98-6)	TWA	1000 ppm
Propylene (115-07-1)	TWA	860 mg/m3 500 ppm

Canada - British Columbia

Components	Type	Value
Ethane (74-84-0)	TWA	1000 ppm
Ethyl Mercaptan (75-08-1)	TWA	0.5 ppm
Propane (74-98-6)	TWA	1000 ppm
Propylene (115-07-1)	TWA	500 ppm

Engineering controls	Explosion proof exhaust ventilation should be used. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Provide adequate ventilation and minimize the risk of inhalation of gas.
Personal protective equipment	
Eye / face protection	If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.
Skin protection	No special requirements under ordinary conditions of use.
Respiratory protection	Wear approved respiratory protection when working with this material unless ventilation is adequate to keep airborne concentrations below recommended exposure standards.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Observe any medical surveillance requirements.

9. Physical & Chemical Properties

Appearance	Gas under normal atmospheric conditions; liquid under pressure.
Color	Colorless.
Odor	Odorless, mercaptan added for odor (skunky odor)
Odor threshold	Not available.
Physical state	Gas.
Form	Gas under normal atmospheric conditions; liquid under pressure.
pH	Not available.
Melting point	Not available.
Freezing point	Not available.
Boiling point	-42.1 °F (-41.2 °C)
Flash point	-156 °F (-104.4 °C) Closed Cup
Evaporation rate	Not available.
Flammability	Not available.
Flammability limits in air, upper, % by volume	9.5 %
Flammability limits in air, lower, % by volume	2.2 %
Vapor pressure	124 psi (100.4 °F)
Vapor density	1.56 (Air=1) (32 °F)
Specific gravity	0.504 (61 °F)
Solubility (water)	Negligible
Partition coefficient (n-octanol/water)	No data available.
Auto-ignition temperature	842 °F (450 °C)
Decomposition temperature	Not available.
VOC	100 %

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal temperature conditions.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Carbon Dioxide. Carbon monoxide.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Components

Propylene (115-07-1)

Test Results

Acute Inhalation LC50 Mouse: 680 mg/l 2 Hours

Acute Inhalation LC50 Rat: 658 mg/l 4 Hours

Components

Propane (74-98-6)
Ethyl Mercaptan (75-08-1)

Test Results

Acute Inhalation LC50 Rat: > 1442.847 mg/l 15 Minutes
Acute Dermal LD50 Rat: > 2000 mg/kg
Acute Inhalation LC50 Mouse: 4420 mg/l 4 Hours
Acute Inhalation LC50 Rat: 4970 mg/l 4 Hours
Acute Oral LD50 Rat: 1034 mg/kg

Toxicological information

This product may contain detectable but varying quantities of the naturally occurring radioactive substance radon 222. The amount in the gas itself is not hazardous, but since radon rapidly decays ($t_{1/2} = 3.82$ days) to form other radioactive elements including lead 210, polonium 210, and bismuth 210, equipment may be radioactive. The radon daughters are solids and therefore may attach to dust particles or form films and sludges in equipment. Inhalation, ingestion or skin contact with radon daughters can lead to the deposition of radioactive material in the lungs, bone, blood forming organs, intestinal tract, kidney and colon. Occupational exposure to radon and radon daughters has been associated with an increased risk of lung cancer in underground uranium miners. Follow the special precautions listed in handling and storage section of this document (see section 7).

Acute effects

This product is an asphyxiant gas which can cause unconsciousness/death if OXYGEN levels are sufficiently reduced. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.

Local effects

May cause central nervous system effects.

Sensitization

Not a skin sensitizer.

Chronic effects

Prolonged exposure may cause chronic effects.

Carcinogenicity

No data available.

ACGIH Carcinogens

Propylene (CAS 115-07-1)

A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

Propylene (CAS 115-07-1)

3 Not classifiable as to carcinogenicity to humans.

Epidemiology

No data available.

Mutagenicity

No data available.

Neurological effects

Central and/or peripheral nervous system damage.

Reproductive effects

No data available.

Teratogenicity

No data available.

12. Ecological Information

Ecotoxicity

The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. The product contains volatile organic compounds which have a photochemical ozone creation potential.

Environmental effects

Ecological injuries are not known or expected under normal use.

Persistence and degradability

No data available.

Bioaccumulation / Accumulation

No data available.

Partition coefficient (n-octanol/water)

No data available.

Mobility in environmental media

The product is a volatile substance, which may spread in the atmosphere.

13. Disposal Considerations

Waste codes

D001: Waste Flammable material with a flash point <140 °F

Disposal instructions

Dispose of this material and its container at hazardous or special waste collection point. Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities. Do not allow this material to drain into sewers/water supplies.

14. Transport Information

DOT

Basic shipping requirements:

UN number UN1978
Proper shipping name Propane
Hazard class 2.1
Environmental hazards
Marine pollutant No
Labels required 2.1

Additional information:

Special provisions 19, T50
Packaging exceptions 306
Packaging non bulk 304
Packaging bulk 314, 315
ERG number 115

IATA

Basic shipping requirements:

UN number 1978
Proper shipping name Propane
Hazard class 2.1

IMDG

Basic shipping requirements:

UN number 1978
Proper shipping name PROPANE
Hazard class 2.1
Subsidiary hazard class 2F
Environmental hazards
Marine pollutant No
EmS No. F-D, S-U

TDG

Basic shipping requirements:

Proper shipping name PROPANE
Hazard class 2.1
UN number UN1978
Additional information:
Special provisions 29, 42



DOT



IATA



IMDG



TDG

15. Regulatory Information

US federal regulations

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

Propylene (CAS 115-07-1) 1.0 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Propylene (CAS 115-07-1) Listed.

CERCLA (Superfund) reportable quantity (lbs)

Propane 100
Ethane 100
Propylene 100
Ethyl Mercaptan 100

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

Section 302 extremely hazardous substance No

Section 311 hazardous chemical No

Drug Enforcement Agency (DEA) Not controlled

WHMIS status Controlled

WHMIS classification
A - Compressed Gas
B1 - Flammable/Combustible
D2B - Other Toxic Effects-TOXIC

WHMIS labeling



State regulations

US - California Hazardous Substances (Director's): Listed substance

Ethyl Mercaptan (CAS 75-08-1) Listed.
Propylene (CAS 115-07-1) Listed.

US - Massachusetts RTK - Substance: Listed substance

Ethyl Mercaptan (CAS 75-08-1) Listed.
Propane (CAS 74-98-6) Listed.
Propylene (CAS 115-07-1) Listed.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

Ethane (CAS 74-84-0) 500 LBS
Ethyl Mercaptan (CAS 75-08-1) 500 LBS
Propane (CAS 74-98-6) 500 LBS
Propylene (CAS 115-07-1) 500 LBS

US - New Jersey RTK - Substances: Listed substance

Ethyl Mercaptan (CAS 75-08-1) Listed.
Propane (CAS 74-98-6) Listed.
Propylene (CAS 115-07-1) Listed.

US - Pennsylvania RTK - Hazardous Substances: Listed substance

Ethyl Mercaptan (CAS 75-08-1) Listed.
Propane (CAS 74-98-6) Listed.
Propylene (CAS 115-07-1) Listed.

16. Other Information

HMIS® ratings
Health: 1
Flammability: 4
Physical hazard: 0

NFPA ratings

Health: 1
Flammability: 4
Instability: 0

Issue date

06-02-2010