

MATERIAL SAFETY DATA SHEET

PROPANE HD-5 ODORIZED

ENTERPRISE PRODUCTS OPERATING L.P. P. O. BOX 4324 HOUSTON, TEXAS 77210		24 HOUR EMERGENCY ASSISTANCE 800-331-3032 or 713-803-8707 CHEMTREC 800-424-9300					
I		GENERAL		HAZARD RATING		HEALTH 2	
TRADE NAME		PROPANE HD-5 ODORIZED PROPANE		LEAST 0> SLIGHT 1>		FIRE 4	
OTHER NAMES		LOW SULFUR, LOW-PROPYLENE, LOW-MOISTURE, LIQUEFIED PROPANE, DIMETHYL METHANE, SPECIAL MOTOR FUEL-GRADE PROPANE		MODERATE 2>		REACTIVITY 0	
CHEMICAL FAMILY		C3 - C8 HYDROCARBON		DOT Hazardous Materials Proper Shipping Name PROPANE OR LIQUIFIED PETROLEUM GAS			
GENERIC NAME		C3 - C4 HYDROCARBONS, C3 RICH		DOT Hazard Class FLAMMABLE GAS			
CAS NO.		74-98-6		UN/IS No. UN 1075			
II		SUMMARY OF HAZARDS					
		EXTREMELY FLAMMABLE! OSHA/NFPA CLASS—1A FLAMMABLE GAS. KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME. VAPOR REDUCES OXYGEN AVAILABLE FOR BREATHING! ASPHYXIANT HAZARD! USE ONLY WITH ADEQUATE VENTILATION. ODOR IS AN INADEQUATE. DO NOT DEPEND ON ODOR AS A WARNING OF DANGEROUS AIR CONCENTRATIONS. MAY CAUSE FROSTBITE OR FREEZE BURNS! AVOID EXPOSURE TO LIQUID OR CRYOGENIC GAS VAPOR LOW BOILING POINT INTENSIFIES PRESSURE AND RAPID DIFFUSION HAZARD!					
III		FIRE AND EXPLOSION					
Flash Point (Method) —160 Deg. F. (AP)		Auto-ignition Temperature (Method) AP 842 Deg. F. E-659 BASED UPON NFPA "PROPYLENE"		Flammable Limits (% Vol. in air) At Normal Atmospheric Temperature and Pressure Lower 2.0 Upper 9.5 BASED UPON NFPA "PROPYLENE"			
Fire and Explosion Hazards		THIS GAS RELEASES FLAMMABLE VAPORS AT WELL BELOW AMBIENT TEMPERATURES AND READILY FORMS FLAMMABLE MIXTURES WITH AIR. EXPOSED TO AN IGNITION SOURCE, IT WILL BURN IN THE OPEN OR BE EXPLOSIVE IN CONFINED SPACES. ITS VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL LONG DISTANCES TO A POINT OF IGNITION, AND THEN FLASH BACK TO SOURCE. ALKANE/CHLORINE GAS MIXTURES HAVE PRODUCED EXPLOSIONS.					
Extinguishing Media		DRY CHEMICAL CO2 HALOGENATED EXTINGUISHING AGENT WATER SPRAY (FOG) CAN BE USED TO DISSIPATE VAPORS USE WATER SPRAY TO COOL ADJACENT EQUIPMENT AND STRUCTURES ADJACENT TO THE FIRE.					
Special Firefighting Procedures		GAS FIRES SHOULD NOT BE EXTINGUISHED UNLESS THE GAS FLOW CAN BE STOPPED IMMEDIATELY. SHUT OFF GAS SOURCE AND ALLOW THE FIRE TO BURN ITSELF OUT. IF THE SOURCE CANNOT BE SHUT OFF IMMEDIATELY, ALL EQUIPMENT AND SURFACES EXPOSED TO THE FIRE SHOULD BE COOLED WITH WATER TO PREVENT OVER-HEATING, FLASHBACKS, OR EXPLOSIONS. CONTROL FIRE UNTIL GAS SUPPLY CAN BE SHUT OFF. FIREMEN MUST USE PROPER PROTECTIVE EQUIPMENT INCLUDING RESPIRATORY APPARATUS TO PROTECT AGAINST HAZARDOUS COMBUSTION PRODUCTS/OXYGEN DEFICIENCIES.					

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IV HEALTH HAZARDS									
Summary of Acute Hazards	ASPHYXIATION. (SEE THE INHALATION BOX BELOW.) FREEZE--BURNS								
Route of Entry	SIGNS AND SYMPTOMS								
Inhalation	EXPOSURE MAY PRODUCE RAPID BREATHING, HEADACHE, DIZZINESS, VISUAL DISTURBANCES, MUSCULAR WEAKNESS, TREMORS, NARCOSIS, UNCONSCIOUSNESS, AND DEATH, DEPENDING ON CONCENTRATION AND TIME OF EXPOSURE.								
Eye Contact	THIS GAS IS NON--IRRITATING; BUT DIRECT CONTACT WITH LIQUEFIED/PRESSURIZED GAS OR FROST PARTICLES MAY PRODUCE SEVERE AND POSSIBLY PERMANENT EYE DAMAGE FROM FREEZE BURNS.								
Skin Absorption	THIS MATERIAL IS NOT EXPECTED TO BE ABSORBED THROUGH THE SKIN BUT EXPOSURE MAY CAUSE FROSTBITE. SHORT TERM CONTACT MAY RESULT IN TISSUE DESTRUCTION AND SEVERE BURNS.								
Skin Irritation	MAY CAUSE MILD SKIN IRRITATION. GAS & LIQUID FORMS OF THIS MATERIAL CAN CAUSE FROSTBITE OR FREEZE BURNS.								
Ingestion	NOT EXPECTED TO BE AN INGESTION HAZARD. CONTACT WITH LIQUID CAN CAUSE FREEZE BURNS.								
Summary of Chronic Hazards and Special Health Effects	INHALATION MAY PRODUCE MILD INTOXICATION, DROWSINESS, OR LOSS OF COORDINATION. HIGH CONCENTRATIONS PRODUCE INTOXICATION FOLLOWED BY LOSS OF CONSCIOUSNESS, ASPHYXIATION, AND DEATH. MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: PERSONNEL WITH PRE--EXISTING CENTRAL NERVOUS SYSTEM, HEART, LIVER, OR KIDNEY DISORDERS OR IMPAIRED PULMONONARY FUCTION SHOULD AVOID CONTACT WITH THIS MATERIAL. PERSONNEL WITH PRE--EXISTING CHRONIC RESPIRATORY DISEASES SHOULD REFRAIN FROM BREATHING THIS MATERIAL								
V PROTECTIVE EQUIPMENT & CONTROL MEASURES									
Respiratory	USE NIOSH/MSHA APPROVED RESPIRATORY PROTECTION EQUIPMENT, AIR PURIFYING WITH ORGANIC VAPOR CARTRIDGES AIR SUPPLIED IF OTHER PROTECTIVE MEASURES DO NOT ADEQUATELY CONTROL EXPOSURES. FOR EMERGENCIES AND UNKNOWN CONCENTRATIONS, USE POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS. UTILIZE RESPIRATORY PROTECTION EQUIPMENT IN ACCORDANCE WITH 29 CFR 1910.134 (RESPIRATORY PROTECTION STANDARD).								
Eye	USE CHEMICAL--TYPE GOGGLES AND FACE SHIELD WHEN HANDLING LIQUIFIED GASES. SAFETY GLASSES AND/OR A FACE SHIELD ARE RECOMMENDED WHEN HANDLING HIGH--PRESSURE CYLENDERS AND PIPING SYSTEMS AND WHENEVER VAPORS ARE DISCHARGED.								
Skin	PREVENT POTENTIAL SKIN CONTACT WITH COW LIQUIDS/VAPORS. USE INSULATED, IMPERVIOUS PLASTIC OR NEOPRENE--COATED CANVAS GLOVES AND PROTECTIVE GEAR (APRON, FACE SHIELD, ETC.) TO PROTECT HANDS AND OTHER SKIN AREAS.								
Engineering Controls	LOCAL EXHAUST AND GENERAL ROOM VENTILATION MAY BOTH BE ESSENTIAL IN WORK AREAS TO PREVENT ACCUMULATON OF EXPLOSIVE MIXTURES. IF MECHANICAL VENTILATION IS USED, ELECTRICAL EQUIPMENT MUST MEET N.E.C. REQUIREMENTS.								
Other Hygienic and Work Practices	EMERGENCY EYE WASH FOUNTAINS AND SAFETY SHOWERS FOR FIRST AID TREATMENT OF POTENTIAL FREEZE BURNS SHOULD BE AVAILABLE IN THE VICINITY OF ANY POTENTIAL EXPOSURE TO COMPRESSED GAS RELEASE. (ANSI 2358.1). (SEE SECTIONS IV. AND VII.) PERSONNEL SHOULD NOT ENTER AREAS WHERE THE ATMOSPHERE IS BELOW 19.5% VOL.% OXYGEN WITHOUT SPECIAL PROCEDURES/EQUIPMENT. RESPIRATOR USE SHOULD COMPLY WITH OSHA 29 CFR 1910.134 OR EQUIVALENT. AVOID SKIN CONTACT								
VI OCCUPATIONAL EXPOSURE LIMITS									
Substance	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">ETHANE</td> <td>N/A</td> </tr> <tr> <td>PROPANE</td> <td>8 HOUR TWA — 1000 PPM (NIOSH)</td> </tr> <tr> <td>ISOBUTANE</td> <td>N/A</td> </tr> <tr> <td>ETHYL MERCAPTAN</td> <td>0.5 PPM (NIOSH)</td> </tr> </table>	ETHANE	N/A	PROPANE	8 HOUR TWA — 1000 PPM (NIOSH)	ISOBUTANE	N/A	ETHYL MERCAPTAN	0.5 PPM (NIOSH)
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Industrial Hygiene
Comments

VII EMERGENCY AND FIRST AID

Inhalation	IMMEDIATELY MOVE PERSONNEL TO AREA OF FRESH AIR, FOR RESPIRATORY DISTRESS, GIVE AIR, OXYGEN, OR ADMINISTER CPR (CARDIOPULMONARY RESUSCITATION). IF NECESSARY, OBTAIN MEDICAL ATTENTION IF BREATHING DIFFICULTIES CONTINUE. GET MEDICAL ATTENTION.
Eye Contact	VAPORS ARE NOT EXPECTED TO PRESENT AN EYE IRRITATION HAZARD. IF CONTACTED BY LIQUID/SOLID IMMEDIATELY FLUSH THE EYE(S) GENTLY WITH WARM WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION IF PAIN OR REDNESS PERSIST. GET MEDICAL ATTENTION.
Skin Contact	FROZEN TISSUES SHOULD BE FLOODED OR SOAKED WITH WARM WATER (105—115 Deg. F). DO NOT USE HOT WATER! CRYOGENIC BURNS WHICH RESULT IN BLISTERING OR DEEPER TISSUE FREEZING SHOULD BE PROMPTLY SEEN BY A PHYSICIAN.
Ingestion	NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL ATTENTION IMMEDIATELY.
Emergency Medical Treatment Procedures	SEE ABOVE PROCEDURES. PERSONNEL WITH PRE—EXISTING SKIN DISORDERS OR CHRONIC RESPIRATORY DISEASES SHOULD AVOID EXPOSURE TO THIS PRODUCT.

VIII SPILL AND DISPOSAL

Precautions if Material is Spilled or Released	ELIMINATE ALL POTENTIAL SOURCES OF IGNITION. EVACUATE ALL NON—ESSENTIAL PERSONNEL TO AN AREA UPWIND. (AT LEAST 1/2 MILE IN ALL DIRECTIONS IF TANKS OR TANK CARS ARE INVOLVED IN FIRE.) STOP SOURCE OF RELEASE WITH NON—SPARKING TOOLS BEFORE PUTTING OUT ANY FIRE. VENTILATE ENCLOSED AREAS TO PREVENT FORMATION OF FLAMMABLE OR OXYGEN—DEFICIENT ATMOSPHERES. WATER SPRAY MAY BE USED TO REDUCE VAPORS. CLOSED SYSTEMS FORM WHITE FROST THAT DO NOT READILY DISPERSE. AVOID VAPOR CLOUD EVEN WITH PROPER RESPIRATORY EQUIPMENT.
Waste Disposal Methods	RELEASES ARE EXPECTED TO CAUSE ONLY LOCALIZED NON— PERSISTENT ENVIRONMENTAL DAMAGE. WASTE MIXTURES CONTAINING THESE GASES SHOULD NOT BE ALLOWED TO ENTER DRAINS OR SEWERS WHERE THERE IS DANGER OF THEIR VAPORS BECOMING IGNITED. WHEN IT BECOMES NECESSARY TO DISPOSE OF THESE GASES, IT IS PREFERRABLE TO DO SO AS A VAPOR. UNUSED PRODUCT MAY BE USED AS AN AUXILLIARY FUEL OR DISPOSED BY BURNING IN A PROPERLY DESIGNED FLARE OR INCINERATOR. VENTING OF GAS TO THE ATMOSPHERE SHOULD BE AVOIDED. DEFECTIVE EMPTY, OR PARTIALLY USED PORTABLE CONTAINERS SHOULD BE RETURNED TO THE SUPPLIER WITH APPROPRIATE TAGS.

IX COMPONENTS

<i>This may not be a complete list of components</i>			
Component Name	ETHANE <6% MAX	PROPYLENE <1.5%	
	PROPANE 90-95%	ISOBUTANE <1.0%	
	ETHYL MERCAPTAN <1%		
<i>Normal concentraton ranges are shown, exceptions may occur.</i>			

X PHYSICAL AND CHEMICAL DATA

Boiling Point 760 mmHg: -44 Deg. F.	Viscosity Units, Temp. (Method) N/A	Dry Point N/A
Freezing Point AP -305 Deg. F	Vapor Pressure mmHg @ 100 Deg. F: 190 psig/205psia	Volatile Characteristics 100%
Speci. Gravity (H ₂ O = 1 at 39.2 Deg. F) AP 0.51	Vapor Sp. Gr. (Air = 1.0 at 60-90 Deg. F) AP 1.5	Solubility In Water NEGLIGIBLE
		pH N/A
Hazardous Polymerization NOT EXPECTED TO OCCUR	Other Chemical Reactivity EVAPORATION RATE (BuAc=1) Rapid	Stability STABLE
Other Physical & Chemical Properties	GROSS HEAT OF COMBUSTION AT 60 Deg. F = 21,650 BTU/LB OR 2,550 BTU/3 LIQUEFIED GAS WHEN STORED UNDER ITS OWN VAPOR PRESSURE	
Appearance and Odor	COLORLESS LIQUID UNDER PRESSURE. DISTINCTIVE ODOR DUE TO ADDED ETHYL MERCAPTAN.	
Conditions to Avoid	EXPOSURE TO HEAT, SPARKS OR OPEN FLAMES	
Materials to	STRONG OXIDIZERS, CHLORINE, FLUORINE AND FLUORINE COMPOUNDS. BROMINE AND METAL CATALYST	

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Avoid

Hazardous

Decomposition Products COMBUSTION MAY PRODUCE CO, NO_x, SO_x, AND REACTIVE HYDROCARBONS

XI ADDITIONAL PRECAUTIONS

Handling,
Storage and
Decontamination
Procedures

REFER TO APPLICABLE OSHA AND DOT REGULATIONS CONCERNING STORAGE, HANDLING, AND SHIPMENT OF PETROLEUM GASES. IF UPON INITIAL RECEIPT INSPECTION, A CYLINDER IS FOUND TO BE IN POOR OPERATING CONDITION. CONTACT THE SUPPLIER THE MOST COMMON HAZARD IS LEAKAGE DUE TO FAULTY PRESSURE CONTROL REGULATORS. LARGE PRESSURE BUILD-UP CAN RESULT IN EXPLOSIVE DECOMPRESSION AT THE CYLINDER HEAD. CAUSING THE CYLINDER TO ROCKET LIKE A MISSILE. USE PRESSURE-REDUCING REGULATORS WHEN CONNECTING TO LOWER PRESSURE PIRNG SYSTEMS. PREVENT ENTRAPMENT OF LIQUID IN CLOSED SYSTEMS. USE CHECK VALVE TO PREVENT BACK-FLOW INTO STORAGE CONTAINER. ALWAYS CHAIN CYLINDERS SECURELY IN AN UPRIGHT POSITION. STORE AND USE GAS CONTAINERS ONLY IN WELL VENTILATED AREAS. STORAGE AREAS SHOULD NOT EXCEED 100 DEG. F AND BE PROTECTED FROM DAMPNESS, SALT, OR CORROSIVE CHEMICALS. OSHA REQUIRES CYLINDER STORAGE BE SEGREGATED FROM OXIDIZERS AND OTHER COMBUSTIBLE MATERIALS BY A DISTANCE OF AT LEAST 30 FEET.

XII REGULATORY INFORMATION

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA), TITLE III

SECTION 311/312 HAZARD CATEGORIES

IMMEDIATE (ACUTE) HEALTH HAZARD

SUDDEN RELEASE OF PRESSURE

FIRE HAZARD

SECTION 313

NO CHEMICALS IN THIS PRODUCT EXCEED THE DE MINIMUS REPORTING LEVEL ESTABLISHED BY SARA

TITLE III, SECTION 313 AND 40 CFR 372.

PROPYLENE

TOXIC SUBSTANCES CONTROL ACT (TSCA)

ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE TSCA INVENTORY.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA)

NO CHEMICALS IN THIS PRODUCT ARE SUBJECT TO THE REPORTING REQUIREMENTS OF CERCLA

XIII SUPPLEMENT

Radioactivity
Hazard

THE INFORMATION BELOW IS GIVEN TO CALL ATTENTION TO THE ISSUE OF "NATURALLY OCCURRING RADIOACTIVE MATERIALS". ALTHOUGH RADON-222 LEVELS IN THE PRODUCT REPRESENTED BY THIS MSDS DO NOT PRESENT ANY DIRECT RADON EXPOSURE HAZARD, CUSTOMERS SHOULD BE AWARE OF THE POTENTIAL FOR RADON DAUGHTER BUILDUP WITHIN THEIR PROCESSING SYSTEMS, WHATEVER THE SOURCE OF THEIR PRODUCT STREAMS. RADON-222 IS A NATURALLY OCCURRING RADIOACTIVE GAS WHICH CAN BE A CONTAMINANT IN NATURAL GAS. DURING SUBSEQUENT PROCESSING, RADON TENDS TO BE CONCENTRATED IN LIQUEFIED PETROLEUM GAS STREAMS AND IN PRODUCT STREAMS HAVING A SIMILAR BOILING POINT RANGE. INDUSTRY EXPERIENCE HAS SHOWN THAT THIS PRODUCT MAY CONTAIN SMALL AMOUNTS OF RADON-222 AND ITS RADIOACTIVE DECAY PRODUCTS. CALLED RADON "DAUGHTERS". THE ACTUAL CONCENTRATION OF RADON-222 AND RADIOACTIVE DAUGHTERS IN THE DELIVERED PRODUCT IS DEPENDENT ON THE GEOGRAPHICAL SOURCE OF THE NATURAL GAS AND STORAGE TIME PRIOR TO DELIVERY. PROCESS EQUIPMENT (I.E., LINES, FILTERS, PUMPS AND REACTION UNITS) MAY ACCUMULATE SIGNIFICANT LEVELS OF RADIOACTIVE DAUGHTERS AND SHOW A GAMMA RADIATION READING DURING OPERATION. A POTENTIAL EXTERNAL RADIATION HAZARD EXISTS AT OR NEAR ANY PIPE VALVE, OR VESSEL CONTAINING A RADON-ENRICHED STREAM, OR CONTAINING INTERNAL DEPOSITS OF RADIOACTIVE MATERIAL DUE TO THE TRANSMISSION OF GAMMA RADIATION THROUGH ITS WALL. FIELD STUDIES REPORTED IN THE LITERATURE AND CONDUCTED BY COMPANY PERSONNEL AT SELECTED SITES, HAVE NOT SHOWN ANY CONDITIONS THAT SUBJECT WORKERS TO CUMULATIVE EXPOSURES IN EXCESS OF GENERAL POPULATION LIMITS. EQUIPMENT EMITTING GAMMA RADIATION SHOULD BE PRESUMED TO BE INTERNALLY CONTAMINATED WITH ALPHA-EMITTING DECAY PRODUCTS WHICH MAY BE A HAZARD IF INHALED OR INGESTED. DURING MAINTENANCE OPERATION THAT REQUIRE THE OPENING OF CONTAMINATED PROCESS EQUIPMENT, THE FLOW OF GAS SHOULD BE STOPPED AND A FOUR HOUR DELAY ENFORCED TO ALLOW THE GAMMA RADIATION TO DROP TO BACKGROUND LEVELS. PROTECTIVE EQUIPMENT SUCH AS COVERALLS, GLOVES, AND RESPIRATOR (NIOSH/MSHA-APPROVED FOR HIGH EFFICIENCY PARTICULATES AND AND RADIONUCLIDES, OR SUPPLIED AIR) SHOULD BE WORN BY PERSONNEL ENTERING A VESSEL OR WORKING ON CONTAMINATED PROCESS EQUIPMENT TO PREVENT SKIN CONTAMINATION, INGESTION, OR INHALATION OF ANY RESIDUES CONTAINING ALPHA RADIATION. AIRBORNE CONTAMINATION MAY BE MINIMIZED BY HANDLING SCALE AND/OR CONTAMINATED MATERIALS IN A WET STATE.

The information contained in this Material Safety Data Sheet relates only to the specific chemical designated herein and may not be valid for such chemical used in combination with any other chemical or mixture, or in any particular process. The best of this Company's knowledge, the information contained herein is accurate as of the date of preparation; however, NO REPRESENTATION, GUARANTEE OR WARRANTY IS MADE AS TO ITS

**FOR ADDITIONAL
INFORMATION OR IN CASE
OF AN ACCIDENT INVOLVING
BODILY INJURY OR
PROPERTY DAMAGE**

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ACCURACY, RELIABILITY OR COMPLETENESS. It is the user's responsibility to satisfy itself of the suitability of such information for the user's particular purpose.

**IMMEDIATELY NOTIFY THE
CORPORATE CLAIMS
DEPARTMENT**

- * During Regular working hours: 7:30 a.m. to 4:00 p.m. Monday through Thursday; 7:30 to 12:30 Friday, contact the Corporate Claims Department at (713) 880-6650, (713) 880-6673, (713) 880-6500. At this time give them full particulars and stand by for further instructions.
- * Before and after regular working hours, and/or weekends or holidays, contact the 24 hour Seminole Control Center Office at 1-800-331-3032. In Houston area 713-803-8707.

CALL CHEMTREC 1-800-424-9300

FOR FURTHER ASSISTANCE IF HAZARDOUS MATERIALS ARE INVOLVED.