unleaded gasolines. Irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments.

An inhalation study with rats exposed to 0, 400 and 1600 ppm of wholly vaporized unleaded gasoline, 6 hours per day on day 6 through 16 of gestation, showed no teratogenic effects nor indication of toxicity to either the mother or the fetus (sex ratio, embryotoxicity, fetal growth and development).

An inhalation study with pregnant rats exposed to 0, 1000, 3000, and 9000 ppm of unleaded gasoline vapor, 6 hours per day on days 6 through 20 of gestation, showed no teratogenic effects nor indications of toxicity to either the mother or the fetus.

In an inhalation study, groups of 6 Fischer rats (3 male, 3 female) were exposed to 2056 ppm of wholly vaporized unleaded gasoline for 6 hours per day, 5 day per week for up to 18 months. Histopathology of the peripheral nervous system and spinal cord revealed no distal axonal neuropathy of the type associated with exposure to n-hexane even though gasoline contained 1.9% n-hexane. The authors concluded that gasoline treatment may have amplified the incidence and prominence of some naturally occurring age related changes in the nervous system.

Wholly vaporized unleaded gasoline was used in a 3 month inhalation study. Groups of 40 rats (20 males, 20 female) and 8 squirrel monkeys (4 male, 4 female) were exposed 6 hours per day and 5 days per week for 13 weeks to 384 or 1552 ppm gasoline. One group of each species served as unexposed controls. The initial conclusion of this study was that inhalation of gasoline at airborne concentrations of up to 1522 ppm caused no toxicity in rats or monkeys. However, further histopathological examination of male rat kidneys on the highest dose group revealed an increased incidence and severity of regenerative epithelium and dilated tubules containing proteinaceous deposits.

Rabbits were exposed to unleaded gasoline 24 hour per day, 5 days per week for two weeks; 0, 2.5, 5 or 8 ml were applied to the skin under an occlusive dressing. Applied in such a way, this motor gasoline was corrosive to the rabbit skin and animals in all dose groups had decreased bodyweights. The slight and/or isolated systemic effects noted in the study were judged to be not significant.

Unleaded gasoline was assayed for mutagenic and cytogenetic activity. Gasoline was not mutagenic, either with or without activation, in Ames assay (Salmonella typhimurium), Saccharamyces cerevisesae, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes exposed to gasoline in vivo. The gasoline was not mutagenic when tested in the mouse dominant lethal assay. Administration of gasoline to rats did not cause chromosomal aberrations in their bone marrow cells.

In a lifetime skin painting study, 50 male Swiss mice were treated with 0.05 ml of unleaded gasoline three times per week. Positive control groups were treated with benzo(a)pyrene in acetone; an untreated negative

control group was also included. The repeated exposure to gasoline caused severe skin irritation, ulceration, hyperkeratosis and abscesses. There was no statistically significant increase in the incidence of skin tumors. Histopathology at the end of the study showed that unleaded gasoline did not increase the incidence of tumors in other organs.

Lifetime inhalation of wholly vaporized unleaded gasoline at 2056 ppm has caused increased liver tumors in female mice. The mechanism of this response is still being investigated but is thought to be an epigenetic process unique to the female mouse. This exposure also caused kidney damage and eventually kidney cancer in male rats. No other animal model studied has shown these adverse kidney effects and there is no physiological reason to believe that they would occur in man. EPA has concluded that the mechanism by which wholly vaporzied unleaded gasoline causes kidney damage is unique to the male rat. The response in that species (kidney damage and cancer) should not be used in human risk assessment.

In their 1988 review of carcinogenic risk from gasoline, The Internatioal Agency for Research on Cancer (IARC) noted that, because published epidemiology studies did not include any exposure data, only occupations where gasoline exposure may have occurred were reviewed. These included gasoline service station attendants and automobile mechanics. IARC also noted that there was no opportunity to separate effects of combustion products from those of gasoline itself. Although IARC allocated gasoline a final overall classification of Group 2B, i.e. possibly carcinogenic to humans, this was based on limited evidence in experimental animals plus supporting evidence including the presence in gasoline of benzene and 1, 3-butadiene. The actual evidence for cacinogenicity in humans was considered inadequate.

To explore the health effects of workers potentially exposed to gasoline vapors in the marketing and distribution sectors of the petroleum industry, the American Petroleum Institute sponsored a cohort mortality, a nested case-control, and an exposure assessment study. Histories of exposure to gasoline were reconstructed for a cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. Data were analyzed based on length of employment, length of exposure, job category, age at first exposure and estimated cumulative and peak exposures. Cumulative exposure was defined as the sum of products of TWA exposure and duration of exposure of each job in an employee's work history. Amoung cohort members, cumulative exposure ranged from 2 to 8,000 ppm-years. In general, long-term drivers at small terminals had the highest exposures, and short-term workers with "other terminal jobs" had the lowest. A peak exposure was defined as an episode in excess of 500 ppm lasting 15 to 90 minutes.

The results of the cohort study indicated that there was no increased mortality from either kidney cancer or leukemia among marketing and marine distribution employees who were exposed to gasoline in the petroleum industry, when compared to the general population. More importantly, based on internal comparisons, there was no association between mortality from kidney cancer or leukemia and various indices of gasoline exposure.

For acute myeloid leukemia (AML), a non-significant mortality increase was

found in land-based terminal employees, but no trend was detected when the data were analyzed by various gasoline exposure indices. This non-significant excess was limited to land-based terminal employees hired prior to 1948. On the other hand, a deficit of mortality from AML was observed among marine employees.

In addition to the cohort study, a subsequent nested case-control study was also conducted. Four diseases were selected for analysis in the case-control study: Leukemia (all cell types), AML, kidney cancer and multiple myeloma. For each case, five individually matched controls were randomly selected from the cohort. In the original cohort study, broad generic job categories were used as part of exposure assessment. In the case-control study, a finer and more homogeneous job classification was developed. In addition to job category, several quantitative gasoline exposure indices were used in the case-control analysis: length of exposure, cumulative exposure (ppm-years in terms of total hydrocarbons) and frequency of peak exposure. Time period of first exposure to gasoline (1948 or before and 1949 or after) was also included as an exposure index. Results of the nested case-control study confirmed the findings of the original cohort study. That is, exposure to gasoline at the levels experienced by this cohort of distribution workers is not a significant risk factor for leukemia (all cell types), acute myeloid leukemia, kidney cancer or multiple myeloma.

12. ECOLOGICAL INFORMATION

ECOTOXICITY:
Gasoline studies have been conducted in the laboratory under a variety of test conditions with a range of fish and invertebrate species. An even more extensive database is available on the aquatic toxicity of individual aromatic constituents. The majority of published studies do not identify the type of gasoline evaluated, or even provide distinguishing characteristics such as aromatic content or presence of lead alkyls. As a result, comparison of results among studies using open and closed vessels, different ages and species of test animals and different gasoline types, is difficult.

The bulk of the available literature on gasoline relates to the environmental impact of monoaromatic (BTEX) and diaromatic (naphthalene, methylnaphthalenes) constituents. In general, non-oxygenated gasoline exhibits some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components which are the most prominent in the water soluble fraction and cause aquatic toxicity, are also highly volatile and can be readily biodegraded by microorganisms.

The 96-hour LC50 in rainbow trout (Oncorhynchus mykiss) is 2.7 mg/l (BTEX). The 48-hour LC50 in daphnia (Daphnia magna) is 3.0 mg/l (BTEX). The 96-hour LC50 in sheepshead minnow (Cyprinodon variegatus) is 8.3 mg/l

(BTEX). The 96-hour LC50 in mysid shrimp (Mysidopsis bahia) is 1.8 mg/l (BTEX).

ENVIRONMENTAL FATE:
Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the weathering of spilled gasoline. The aqueous solubility of non-oxygenated unleaded gasoline, based on analysis of benzene, toluene, ethylbenzene+xylenes and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

13. DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible.

This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by USEPA under RCRA (40CFR261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

14. TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT SHIPPING NAME: GASOLINE
DOT HAZARD CLASS: 3 (FLAMMABLE LIQUID)
DOT IDENTIFICATION NUMBER: UN1203
DOT PACKING GROUP: II

15. REGULATORY INFORMATION

SARA 311 CATEGORIES:

1. Immediate (Acute) Health Effects: YES
2. Delayed (Chronic) Health Effects: YES
3. Fire Hazard: YES
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01=SARA 313	11=NJ RTK	22=TSCA Sect 5(a)(2)
02=MASS RTK	12=CERCLA 302.4	23=TSCA Sect 6
03=NTP Carcinogen	13=MN RTK	24=TSCA Sect 12(b)
04=CA Prop 65-Carcin	14=ACGIH TWA	25=TSCA Sect 8(a)
05=CA Prop 65-Repro Tox	15=ACGIH STEL	26=TSCA Sect 8(d)
06=IARC Group 1	16=ACGIH Calc TLV	27=TSCA Sect 4(a)
07=IARC Group 2A	17=OSHA PEL	28=Canadian WHMIS
08=IARC Group 2B	18=DOT Marine Pollutant	29=OSHA CEILING
09=SARA 302/304	19=Chevron TWA	30=Chevron STEL
10=PA RTK	20=EPA Carcinogen	

The following components of this material are found on the regulatory lists indicated.

BENZENE, ETHYL-
  is found on lists: 01,02,08,10,11,12,13,14,15,17,26,28,
N-BUTANE
  is found on lists: 02,10,11,13,14,28,
CYCLOHEXANE, METHYL
  is found on lists: 02,10,11,13,14,17,26,28,
TOLUENE
  is found on lists: 01,02,05,10,11,12,13,14,17,26,28,29,
N-HEXANE
  is found on lists: 01,02,10,11,12,13,14,17,27,28,
CYCLOHEXANE
  is found on lists: 01,02,10,11,12,13,14,17,26,28,
BENZENE, DIMETHYL-
  is found on lists: 01,02,10,11,12,13,14,15,17,
N-HEPTANE
  is found on lists: 02,10,11,13,14,15,17,26,28,
2-METHOXY-2-METHYL PROPANE
  is found on lists: 01,02,10,11,12,14,24,26,27,30,
BENZENE, TRIMETHYL-
  is found on lists: 02,10,11,13,14,26,28,
2,2,4-TRIMETHYLPENTANE
  is found on lists: 02,10,11,12,26,
2-ETHOXY-2-METHYL PROPANE

is found on lists: 25,26,
ETHYL ALCOHOL
is found on lists: 02,10,11,13,14,17,28,
BENZENE
is found on lists: 01,02,03,04,06,10,11,12,13,14,15,17,20,28,29,
2-METHOXY-2-METHYL-BUTANE
is found on lists: 24,25,26,27,30,
GASOLINE (GENERIC)
is found on lists: 04,08,14,15,17,
PENTANES
is found on lists: 14,15,17,
HEXANES
is found on lists: 14,15,

WHMIS CLASSIFICATION:
Class B, Division 2: Flammable Liquids
Class D, Division 2, Subdivision A: Very Toxic Material
-Carcinogenicity
Class D, Division 2, Subdivision B: Toxic Material
-Skin or Eye Irritation

16. OTHER INFORMATION

NFPA RATINGS: Health 1; Flammability 3; Reactivity 0;
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT:
This revision updates Sections 1, 3, 5, 7, 9, 15, & 16.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	TPQ - Threshold Planning Quantity
RQ - Reportable Quantity	PEL - Permissible Exposure Limit
C - Ceiling Limit	CAS - Chemical Abstract Service Number
A1-5 - Appendix A Categories	() - Change Has Been Proposed
NDA - No Data Available	NA - Not Applicable

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Toxicology and Health Risk Assessment Unit, CRTC, P.O. Box 1627, Richmond, CA 94804

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibil-ity for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

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Revision Number: 14 Revision Date: 07/22/00 MSDS Number: 002914

GREASE

* *
* M S D S *
* *
* Canadian Centre for Occupational Health and Safety *
* * * * * * * * * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 287372
PRODUCT NAME(S) : Inland 16350 High Vacuum Grease (Perfluorinated polyether thickened with fluorotelomer)
DATE OF MSDS : 1986-12-19
CURRENCY NOTE : MSDS Confirmed Current: 1997-05-13

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Inland Vacuum Industries
ADDRESS : 35 Howard Avenue
Churchville New York
U.S.A. 14428
EMERGENCY TELEPHONE NO. : 716-293-3330 (Days)
803-548-2346 (Evenings)

*** MATERIAL SAFETY DATA ***

IDENTITY Inland 16350 High Vacuum Grease (Perfluorinated polyether thickened with fluorotelomer)

SECTION I

PREPARATION DATE 12-19-86
PREPARER'S SIGNATURE

SECTION II HAZARDOUS INGREDIENTS AND IDENTITY INFORMATION

HAZARDOUS COMPONENT	OSHA PEL	ACGIH TLV	OTHER LIMITS	%(OPT)
Fluorine end-capped homopolymers of hexafluoropropylene epoxide thickened with fluorotelomers				100

SECTION III PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT (deg C)	>200
SPECIFIC GRAVITY (H2O=1)	>1.90
VAPOR PRESSURE (Torr)	<.0001
MELTING POINT (deg C) (pour point)	-45 to -5
VAPOR DENSITY (AIR=1)	~70
EVAPORATION RATE (BUTYL ACETATE=1)	Nil
SOLUBILITY IN WATER	Nil
APPEARANCE AND ODOR	white dense, viscous fluid

SECTION VI FIRE AND EXPLOSION DATA

FLASH POINT (METHOD USE) None (Pensky-Martens Closed Cup)
FLAMMABLE LIMITS Not applicable LEL UEL
EXTINGUISHING MEDIA As appropriate for other combustibles in the area
SPECIAL FIRE FIGHTING PROCEDURES Wear breathing gear when fighting fires in enclosed areas because decomposition of Krytox at flame temperatures may form toxic fluorine compounds.
UNUSUAL FIRE AND EXPLOSION HAZARDS None

SECTION V REACTIVITY DATA

STABLE (Y/N) [Y] CONDITIONS TO AVOID
HAZARDOUS POLYMERIZATION (Y/N) [N] CONDITIONS TO AVOID
INCOMPATIBILITY No Incompatibilities are reasonably foreseen
HAZARDOUS DECOMPOSITION PRODUCTS See Health Hazard Information

SECTION VI HEALTH HAZARD DATA

ROUTES OF ENTRY: INHALATION: Not normally
SKIN: Yes
INGESTION: Not normally

HEALTH HAZARDS (ACUTE AND CHRONIC) Acute: May cause mild eye irritation and mild skin irritation. Inhalation of smoke from tobacco contaminated with this compound may cause throat irritation, cough and tightness in chest.
The known physiological effects of the separate ingredients of these materials indicate a very low order of toxicity in animals by skin contact (ALD >17000 mg/kg rabbits); by ingestion (ALD >25000mg/kg rats); and at-room-temperature inhalation (4 hr ALC 19.54 mg/l rats). Decomposition products formed at temperatures above 260 C are irritating to the lungs of animals. Pulmonary edema and death occurred in rats exposed to decomposition products may include lung irritation. Inhalation of decomposition products formed at ~290 C may required treatment of lung irritation for fluorine compounds which can cause

delayed pulmonary edema. Prolonged skin contact may cause redness and inflammation of hair follicles without sensitization.

CARCINOGENICITY NTP IARC MONOGRAPHS OSHA REGULATED
None of the components of this chemical is listed by IARC, NTP, or OSHA as a carcinogen.

SYMPTOMS OF EXPOSURE See above

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE Unknown

EMERGENCY FIRST AID PROCEDURES Inhalation - if inhaled remove to fresh air. If not breathing, give artificial respiration and call a physician. Skin contact - flush skin with water after prolonged or repeated contact. Eye contact - immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. Ingestion - do not induce vomiting. Immediately give two glasses of water or activated charcoal slurry. Never give anything by mouth to an unconscious person.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Soak up spill with sawdust sand, oil-dry or other absorbent material. Remove sources of heat and flame. At 260-290 C material forms potentially toxic fluorine compounds. Avoid breathing any decomposition products. Place in container for disposal. Review other areas of this sheet for additional information.

WASTE DISPOSAL METHOD Dispose of in accordance with appropriate Federal, State and Local regulations. Do not flush liquid to surface water or sanitary sewer system.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING No special precautions..not regulated by DOT

OTHER PRECAUTIONS

SECTION VIII CONTROL MEASURES

RESPIRATORY PROTECTION (TYPE) should not be required when working with material under normal conditions

VENTILATION LOCAL SPECIAL
MECHANICAL OTHER

PROTECTIVE GLOVES Impermeable rubber gloves

EYE PROTECTION Goggles or safety glasses with side shields

OTHER PROTECTIVE EQUIPMENT n.a.

WORK/HYGENIC PRACTICES Keep containers tightly closed. Do not consume food or tobacco in areas where they could become contaminated with this material. Provide adequate ventilation. Keep material from heat and flame.

ISN: 287372

HALON

M S D S

Canadian Centre for Occupational Health and Safety

Issue : 2001-1 (February, 2001)

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 950167
PRODUCT NAME(S) : HALON 1211, BCF
PRODUCT IDENTIFICATION : Form No. F-85320-7
DATE OF MSDS : 1995-03-08

*** MANUFACTURER INFORMATION ***

MANUFACTURER : ANSUL INCORPORATED
ADDRESS : One Stanton Street
Marinette Wisconsin
U.S.A. 54143-2542
Telephone: 715-735-7411 (Other Information Calls)
EMERGENCY TELEPHONE NO. : 800-424-9300 (CHEMTREC)

HALON 1211

QUICK IDENTIFIER (In Plant Common Name)

Prepared By: Safety and Health Department
Date Prepared: March 8, 1995

SECTION 1 - IDENTITY

Common Name: (used on label) Halon 1211, BCF
(Trade Name and Synonyms)
CAS No.: N/A
Chemical Name: Bromochlorodifluoromethane
Chemical Family: Halogenated Hydrocarbon
Formula: CF_2ClBr

SECTION 2 - INGREDIENTS

PART A - HAZARDOUS INGREDIENTS

Principal Hazardous Component(s) (chemical and common name(s)):	%	CAS No.
Bromochlorodifluoromethane Chemical Listed Under SARA Title	Greater than 99	353-59-3

III - Section 311

ACGIH TLV: Not listed
Acute Toxicity Data:
ihl rat LCLO 32 pph/15 M

WARNING:
Bromochlorodifluoromethane is a substance which harms public health and environment by destroying ozone in the upper atmosphere.

PART B - OTHER INGREDIENTS

Other Component(s) (chemical and common name(s)):	%	CAS No.
None	N/A	N/A

Acute Toxicity Data: N/A

SECTION 3 - PHYSICAL AND CHEMICAL CHARACTERISTICS

(Fire and Explosion Data)

Boiling Point: 26 deg F
Specific Gravity (H2O=1): 1.83
Vapor Pressure (mm Hg): 37.5 psi @ 70 deg F

Percent Volatile by Volume (%): 100
Vapor Density (Air = 1): 5.7
Evaporation Rate (Butyl acetate = 1): Gas at room temperature
Solubility in Water: Negligible
Reactivity in Water: Unreactive
Appearance and Odor: Colorless gas, sweet odor.

Flash Point: None to boiling
Flammable Limits in Air % by Volume: N/A
Extinguisher Media: N/A
Auto-Ignition Temperature: N/A

Special Fire Fighting Procedures: THIS IS A FIRE EXTINGUISHING AGENT. Use water to cool fire-exposed cylinders or other containers. Self-contained breathing apparatus with full facepiece and protective clothing when re-entering unventilated fire areas where product has been used.

Unusual Fire and Explosion Hazards: Containers are equipped with pressure and temperature relief devices, but rupture may occur under fire conditions and toxic decomposition by-products may be formed if used in fires over 900 deg F.

SECTION 4 - PHYSICAL HAZARDS

Stability:	Unstable [ ] Stable [x]	Conditions to Avoid:	Decomposes under fire conditions above 900 deg F.

Incompatibility (Materials to Avoid): Active metals and fires involving metal hydrides.

Hazardous Decomposition Products: Thermal decomposition; BCF begins decomposing at temperatures above 900 def F to give free halogens, halogen acids, and small amounts of carbonyl halides. These by-products have a sharp irritating odor. They are dangerous even in low concentrations, can result in personal injury or death.

Hazardous Polymerization:	May Occur [ ] Will Not Occur [x]	Conditions to Avoid:	N/A

NOTE: As used in Ansul extinguishers or cylinders, Halon 1211 is a gas compressed under pressure up to 150 psi at 70 deg F.

SECTION 5 - HEALTH HAZARDS

Threshold Limit Value: None listed in ACGIH or OSHA. NOTE: The effects of exposure to Halon 1211 should disappear quickly upon removal from exposure.

Routes of Entry:

- Eye Contact: The liquid form of this material can produce chilling sensations and discomfort.
- Skin Contact: Systemically toxic concentrations are unlikely to be absorbed through the skin in man. Evaporation of liquid from the skin can produce chilling sensations. Skin injury does not result.
- Inhalation: Exposures to concentrations of this material above 4% for longer than one (1) minute can cause toxic side effects.
- Ingestion: Ingestion is not likely to occur since this material is gas at room temperature.

Signs and Symptoms:

- Acute Overexposure: Dizziness, impaired coordination, reduced mental acuity, and cardiac effects above 4 % concentration in excess of one minute. Unconsciousness or even death in high concentrations with longer exposures.
- Chronic Overexposure: Unknown

Medical Conditions Generally Aggravated by Exposure: Cardiac problems

Chemical Listed as Carcinogen or Potential:

National Toxicology Yes [ ] I.A.R.C. Yes [ ] OSHA: Yes [ ]

Program: No [x] Monographs: No [x] No [x]

SECTION 6 - EMERGENCY AND FIRST AID PROCEDURES

Eye Contact:	Immediately flush eyes with plenty of water for at least 15 minutes while holding lids open. If redness, itching or a burning sensation develops, get Medical attention.
Skin Contact:	Wash the material off the skin with copious amounts of soap and water for at least 15 minutes. If redness, itching or a burning sensation develops, get Medical attention.
Inhalation:	Remove victim to fresh air. If cough or other respiratory symptoms occur, consult Medical personnel. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Consult Medical personnel.
Ingestion:	If patient is conscious, give 1 or 2 glasses of warm water to drink and get Medical attention. DO NOT INDUCE VOMITING. Have victim lie down and keep warm.

NOTE TO PHYSICIAN: Product is an asphxiant and can induce cardiac muscle sensitization to circulating epinephrine-like compounds. Do NOT give adrenalin or similar sympathomimetic drugs. Do NOT allow victim to exercise until 24 hours following specific exposures. Freeze burns of mucosal tissue can develop following specific exposures.

SECTION 7 - SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type):	Not normally necessary if controls are adequate. For high concentrations exceeding 4%, or if exposure is prolonged, use positive pressure air-supplied respirator.

Ventilation:	Local Exhaust: Recommended to control exposures. See mechanical.	Mechanical (General): Recommended in low areas or indoors where vapors may collect.	
Protective Gloves:	Plastic if working with liquid.	Eye Protection:	Chemical goggles recommended. Full faceshield in addition if splashing of liquid form is possible.

Other Protective Clothing or Equipment:	Eye wash and safety showers are good safety practice in work areas when working with liquefied product.

SECTION 8 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken in Handling and Storage:	Store as a liquefied compressed gas in DOT approved pressure vessels away from high temperatures. If cylinder is not connected to a system, it must be safety capped to protect against actuation of valve and release of agent.
Other Precautions:	Note incompatibility information in Section 4.
Steps to be Taken in Case Material is Released or Spilled:	Evacuate area; ventilate to outside atmosphere. Cool or remove hot, metal surfaces or source of non-extinguished flames.
Waste Disposal Methods:	Dispose of in compliance with local, state, and federal regulations.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS

HAZARD INDEX:

4	Severe Hazard	2	HEALTH
3	Serious Hazard	0	FLAMMABILITY
2	Moderate Hazard	0	REACTIVITY
1	Slight Hazard		
0	Minimal Hazard		

N/A = Not Applicable NDA = No Data Available

Form No. F-85320-7

HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

M S D S

Canadian Centre for Occupational Health and Safety

Issue : 2001-1 (February, 2001)

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2041059
PRODUCT NAME(S) : NON-FLAMMABLE GAS MIXTURE
Containing One or More of the Following Components in a Nitrogen or Helium Balance Gas: Oxygen, 0 - 23.5%; Carbon Dioxide, 0.005 - 50.0%; Methane: 0 - 2.5%
PRODUCT IDENTIFICATION : Document Number: 50015
DATE OF MSDS : 1997-03-24

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : BACHARACH, INC
ADDRESS : 625 ALPHA DRIVE
PITTSBURGH PENNSYLVANIA
U.S.A. 15238
Telephone: 412-963-2223 (INFORMATION)
Fax: 412-963-2091
EMERGENCY TELEPHONE NO. : 800-424-9300 (CHEMTREC)

MATERIAL SAFETY
DATA SHEET
Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: **Non-Flammable Gas Mixture**

Containing One or More of the Following Components in a Nitrogen or Helium Balance Gas: Oxygen, 0-23.5%; Carbon Dioxide, 0.005-50.0%; Methane; 0-2.5%

SYNONYMS: Not Applicable
CHEMICAL FAMILY NAME: Not Applicable
FORMULA: Not Applicable
Document Number: 50015 (Replaces Bacharach MSDS No. 99-0196)

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

PRODUCT USE:	Calibration of Monitoring and Research Equipment
SUPPLIER:	BACHARACH, INC.
MSDS RESPONSIBILITY:	AIR LIQUIDE AMERICA CORPORATION
ADDRESS:	821 Chesapeake Drive Cambridge, MD 21613
EMERGENCY PHONE:	CHEMTREC: 1-800-424-9300
BUSINESS PHONE:	1-410-228-6400
General MSDS Information	1-713/868-0440
Fax on Demand:	1-800/231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

		EXPOSURE LIMITS IN AIR					
		ACGIH		OSHA			
		TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	OTHER
CHEMICAL NAME:	Carbon Dioxide	5000	30,000	5000 10,000 (Vacated 1989 PEL)	30,000 (Vacated 1989 PEL)	40,000	DFG-MAK: 5000 NIOSH REL TWA: 5000 C: 30000 ppm
CAS #:	124-38-9						
mole %:	0.005-50.0%						

CHEMICAL NAME:	**Oxygen**	There are no specific exposure limits for Oxygen.
CAS #:	7782-44-7	Oxygen levels should be maintained above 19.5%.
mole%:	0 - 23.5%	
CHEMICAL NAME:	**Methane**	There are no specific exposure limits for Methane.
CAS #:	74-82-8	Methane is a simple asphyxiant (SA). Oxygen levels
mole %:	0-2.5%	should be maintained abouve 19.5%.
CHEMICAL NAME:	**Nitrogen/ Helium**	There are no specific exposure limits for Nitrogen or Helium. These gases are simple asphyxiants (SA).
CAS #:	7727-37-9/ 7440-59-7	Oxygen levels should be maintained above 19.5%.
mole %:	Balance	

NE = Not Established. C = Ceiling Limit.
See Section 16 for Definitions of Terms Used.

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a colorless, cdorless gas. A significant hazard associated with releases of this product is the potential for over-exposure to Carbon Dioxide, a component of this gas mixture. Inhalation of Carbon Dioxide can increase respiration and heart rate, possibly resulting in circulatory insufficiency (which may lead to coma and death). At concentrations between 2-10%, Carbon Dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. If the concentration of Carbon Dioxide reaches 10% or more, suffocation can occur within minutes. Additionally, releases of this product may produce oxygen-deficient atmospheres (especially in confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

HAZARDOUS MATERIAL INFORMATION SYSTEM

HEALTH	(BLUE)	[1]
FLAMMABILITY	(RED)	[0]
REACTIVITY	(YELLOW)	[0]
PROTECTIVE EQUIPMENT		[B]

EYES	RESPIRATORY	HANDS	BODY
	See Section 8		

For routine industrial applications

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this product is by inhalation.

INHALATION: Due to the small size of an individual cylinder of this product, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. A significant hazard associated with releases of this product is the potential for over-exposure to Carbon Dioxide, a component of this gas mixture. If this product is released in a small, poorly ventilated area (i.e. an enclosed or confined space), and if the concentration of Carbon Dioxide reaches 10% or more, suffocation can occur within minutes. At concentrations between 2-10%, Carbon Dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. Carbon Dioxide initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Symptoms in humans are as follows:

CONCENTRATION OF CARBON DIOXIDE	OBSERVED EFFECT
1%	Slight increase in breathing rate.
2%	Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness.
3%	Breathing increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increase in blood pressure and pulse rate.
4-5%	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident and slight choking

	may be felt.
5-10%	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness.
50-100%	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.

Additionally, if mixtures of this product contain less than 19.5% Oxygen and are released in a small, poorly-ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The effects associated with various levels of oxygen are as follows:

CONCENTRATION OF OXYGEN	OBSERVED EFFECT
12-16% Oxygen:	Breathing and pulse rate increased, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea, vomiting, collapse, or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.

CONTACT WITH SKIN or EYES: Exposure to high concentrations of Carbon Dioxide (a component of this gas mixture) may cause eye irritation with symptoms such as pain, redness, and tearing. Prolonged contact of high concentrations of Carbon Dioxide with the eyes can cause damage to the retinal ganglion cells.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects:

ACUTE: Due to the small size of the individual cylinder of this product, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. Inhalation of high concentrations of Carbon Dioxide (a component of this gas mixture) can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. High concentrations of Carbon Dioxide may cause eye irritation, and potential eye damage. Another significant hazard associated with this gas mixture when it contains less than 19.5% oxygen is the potential for exposure to oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, ringing in ears, headaches, shortness of breath, wheezing, headache, dizziness, indigestion, nausea, unconsciousness, and death. The skin of a victim of over-exposure may have a blue color.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to this gas.

TARGET ORGANS: Respiratory system, central nervous system, and eyes.

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn.

No unusual health effects are anticipated after exposure to this product, due to the small cylinder size. If any adverse symptom develops after over-exposure to this product, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary.

Victim(s) who experience any adverse effect after over-exposure to this product must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

NFPA RATING

FLAMMABILITY [0]

HEALTH [1] [0] REACTIVITY

[ ]

OTHER

FLASH POINT, (method): Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):
Lower (LEL): Not applicable.
Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire. Pressure in a container can build-up due to heat and it may rupture if pressure relief devices should fail to function.

Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this product presents significantly less risk of an oxygen deficient environment and other safety hazards than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for Carbon Dioxide and oxygen. Carbon Dioxide should not be above background levels and Oxygen levels must be above 19.5% before non-emergency personnel are allowed to re-enter area.

If leaking incidentally from the cylinder, contact your supplier.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to fatal concentrations of this product could occur without any significant warning symptoms, due to carbon dioxide over-exposure and oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify the cylinders containing this gas mixture. If there is a malfunction or another type of operational problem, contact nearest distributor immediately.

STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21 deg C, 70 deg F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage.

Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING! Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that 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: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this product in well-ventilated areas. If this product is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of Carbon Dioxide and Oxygen.

RESPIRATORY PROTECTION: No special respiratory prctection is required under normal circumstances of use. Use supplied air respiratory protection if the level of Carbon Dioxide exceeds exposure limits presented in Section 2 (Composition and Information of Ingredients) and oxygen levels are below 19.5% or unknown during emergency response to a release of this product. If respiratory protection is required for emergency response to this product, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards. Respiratory selection guidelines from NIOSH for Carbon Dioxide are provided below for information.

NIOSH/OSHA RECOMMENDATIONS FOR CARBON DIOXIDE CONCENTRATIONS IN AIR:

UP TO 40,000 ppm:	Supplied Air Respirator (SAR); or full-facepiece Self-Contained Breathing Apparatus (SCBA).
EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS:	Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.
ESCAPE:	Escape-type SCBA.
NOTE:	The IDLH concentration for Carbon Dioxide is 40,000 ppm.

EYE PROTECTION: Safety glasses.

HAND PROTECTION: No special prctection is needed under normal circumstances of use.

BODY PROTECTION: No special protection is needed under normal circumstances of use.

9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for Nitrogen, a main component of this gas mixture.

GAS DENSITY @ 32 deg F (0 deg C) and 1 atm: 0.072 lbs/ ft3 (1.153 kg/m3)
BOILING POINT: -320.4 deg F (-195.8 deg C)
FREEZING/MELTING POINT @ 10 psig -210 deg C (-345.8 deg F)
SPECIFIC GRAVITY (air = 1) @ 70 deg F (21.1 deg C): 0.906
pH: Not applicable.
SOLUBILITY IN WATER vol/vol @ 32 deg F (0 deg C) and 1 atm: 0.023
MOLECULAR WEIGHT: 28.01
EVAPORATION RATE (nBuAc = 1): Not applicable.
EXPANSION RATIO: Not applicable.
ODOR THRESHOLD: Not applicable.
SPECIFIC VOLUME (ft3/lb): 13.8
VAPOR PRESSURE @ 70 deg F (21.1 deg C) psig: Not applicable.
COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

The following information is for Helium, a main component of this gas mixture.
GAS DENSITY @ 32 deg F (0 deg C) and 1 atm: 0.0103 lbs/cu ft (1.165 kg/m3)
BOILING POINT: -452.1 deg F (-268.9 deg C)
FREEZING/MELTING POINT (@ 10 psig): Not applicable.
SPECIFIC GRAVITY (air = 1) @ 70 deg F (21.1 deg C): 0.1381
pH: Not applicable.
SOLUBILITY IN WATER vol/vol at 32 deg F (0 deg C)and 1 atm: 0.0094
MOLECULAR WEIGHT: 4.00
EVAPORATION RATE (nBuAc = 1): Not applicable.
EXPANSION RATIO: Not applicable.
ODOR THRESHOLD: Not applicable. Odorless.
SPECIFIC VOLUME (ft3/lb): 96.7
VAPOR PRESSURE @ 70 deg F (21.1 deg C) (psig): Not applicable.
COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

The following information is for the gas mixture.
APPEARANCE AND COLOR: This product is a colorless, odorless gas.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no unusual warning properties associated with a release of this product. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

10. STABILITY and REACTIVITY

STABILITY: Normally stable in gaseous state. Moisture in the air could lead to the formation of carbonic acid from Carbon Dioxide.

DECOMPOSITION PRODUCTS: Methane, a component of this gas mixture, will thermally decompose in air to generate carbon monoxide and carbon dioxide. The other components of this gas mixture do not decompose, per se, but may react with other compounds in the heat of a fire.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (a component of this product). Lithium reacts slowly with Nitrogen at ambient temperatures. A component of this product (Methane) is also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen difluoride, and nitrogen trifluoride). Carbon Dioxide, another component of this gas mixture, will ignite and explode when heated with powdered aluminum, beryllium, cerium alloys, chromium, magnesium-aluminum alloys, manganese, thorium, titanium, and zirconium. In the presence of moisture, Carbon Dioxide will ignite with cesium oxide. Metal acetylides will also ignite and explode on contact with Carbon Dioxide.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this product:

METHANE: There are no specific toxicology data for Methane. Methane is a simple asphyxiant, which acts to displace oxygen in the environment.
Carbon Dioxide: This gas is a simple asphyxiant with physiological effects at high concentration.

TCLo(inhalation, rat) = 6 pph/24 hours; reproductive and teratogenic effects
LCLo(inhalation, human) = 9 pph/ 5 minutes
LCLo(inhalation, mammal) = 90,000 ppm/5 minutes

NITROGEN: There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the environment.

HELIUM: There are no specific toxicology data for Helium. Helium is a simple asphyxiant (SA), which acts to displace oxygen in the environment

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

IRRITANCY OF PRODUCT: Not applicable.

SENSITIZATION TO THE PRODUCT: The components of this gas mixture are not known to be sensitizers.

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 expected to cause mutagenic effects in humans.
Embryotoxcity: This product has not been reported to cause embryotoxic effects.
Teratogenicity: This product is not expected to cause teratogenic effects in humans. Clinical studies involving test animals exposed to high concentrations of Carbon Dioxide indicate teratogenic effects.
Reproductive Toxicity: This product is not expected to cause adverse reproductive effects in humans. Clinical studies involving test animals exposed to high concentrations of Carbon Dioxide indicate reproductive effects.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions may be aggravated by over-exposure to the components of this product. Additionally, over-exposure to Carbon Dioxide (a component of this gas mixture) may aggravate eye disorders and central nervous system conditions.

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen, if necessary; treat symptoms and eliminate exposure.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for this gas mixture.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The components of this gas mixture occur naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this product.

Oxygen: Water Solubility = 1 volume Oxygen/32 volumes water at 20 deg C. Log Kow = -0.65
Nitrogen: Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0 deg C. 1.6 volumes Nitrogen/100 volumes water at 20 deg C.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects on plant and animal life.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME:	Compressed gases, n.o.s. (Nitrogen, Carbon Dioxide) or (Helium, Carbon Dioxide)
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1956
PACKING GROUP:	Not applicable.
DOT LABEL(S) REQUIRED:	Non-Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): 126

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: The components of the gas mixture are subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

COMPONENT	SARA 302	SARA 304	SARA 313
Oxygen	NO	NO	NO
Methane	NO	NO	NO
Carbon Dioxide	NO	NO	NO
Helium	NO	NO	NO
Nitrogen	NO	NO	NO

SARA Threshold Planning Quantity: Not applicable.

TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.

CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

OTHER U.S. FEDERAL REGULATIONS:

Methane is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 10,000 pounds.

This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82).

Nitrogen, Helium, Carbon Dioxide and Oxygen are not listed as Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Methane is are listed under this regulation in Table 3 as a

Regulated Substance (Flammable Substance), in quantities of 10,000 lbs (4,553 kg) or greater.

OTHER CANADIAN REGULATIONS: This gas mixture is categorized as a Controlled Product, Hazard Class A, as per the Controlled Product Regulations.

STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: Methane, Carbon Dioxide, Helium.
California - Permissible Exposure Limits for Chemical Contaminants: Nitrogen, Methane, Carbon Dioxide, Helium.
Florida - Substance List: Oxygen, Carbon Dioxide, Helium.
Illinois - Toxic Substance List: Carbon Dioxide, Helium.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: Oxygen, Methane, Carbon Dioxide, Helium.
Minnesota - List of Hazardous Substances: Methane, , Carbon Dioxide, Helium.
Missouri - Employer Information/Toxic Substance List: Methane, Carbon Dioxide, Helium.
New Jersey - Right to Know Hazardous Substance List: Oxygen, Nitrogen, Methane, Carbon Dioxide, Helium.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.
Pennsylvania - Hazardous Substance List: Oxygen, Nitrogen, Methane, Carbon Dioxide, Helium.
Rhode Island - Hazardous Substance List: Oxygen, Nitrogen, Methane, Carbon Dioxide, Helium.
Texas - Hazardous Substance List: Carbon Dioxide.
West Virginia - Hazardous Substance List: Carbon Dioxide.
Wisconsin - Toxic and Hazardous Substances: Carbon Dioxide.

CALIFORNIA PROPOSITION 65: No component of this product is on the California Proposition 65 lists.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. Air Liquide America will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scrapping cylinders involves some preparation before the metal dealer may accept

them. We perform this operation as a service to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1	"Safe Handling of Compressed Gases in Containers"
AV-1	"Safe Handling and Storage of Compressed Gases"
	"Handbook of Compressed Gases"

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
9163 Chesapeake Drive, San Diego, CA 92123-1002
619/565-0302
Fax on Demand: 1-800/231-1366

HYDRAULIC OIL

* *
* M S D S *
* *
* Canadian Centre for Occupational Health and Safety *
* * * * * * * * * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2313097
PRODUCT NAME(S) : BP AW HYDRAULIC OIL 32
LUBRICATING OIL; HYDRAULIC OIL
PRODUCT IDENTIFICATION : MSDS No. 0494105 US/ENGLISH
CAS NUMBER: 64741-88-4
DATE OF MSDS : 2000-01-24
CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 2000-05-31

*** MANUFACTURER INFORMATION ***

MANUFACTURER : BP Lubricants
ADDRESS : 28100 Torch Parkway
Warrenville Illinois
U.S.A. 60555-4015
Telephone: 630-434-6377 (OTHER PRODUCT SAFETY INFORMATION)
EMERGENCY TELEPHONE NO. : 312-856-2200 (HEALTH INFORMATION, USA)
703-527-3887 (SPILL INFORMATION, CHEMTREC, USA)

*** MATERIAL SAFETY DATA ***

MSDS No. 0494105 US/ENGLISH

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/SUPPLIER:
BP Lubricants
28100 Torch Parkway
Warrenville, Illinois 60555-4015
U.S.A.

EMERGENCY HEALTH INFORMATION:
1 (800) 447-8735

EMERGENCY SPILL INFORMATION:
1 (800) 424-9300 CHEMTREC (USA)

OTHER PRODUCT SAFETY INFORMATION:
1 (630) 434-6377 (USA)

SUBSTANCE: BP AW HYDRAULIC OIL 32

TRADE NAMES/SYNONYMS:
LUBRICATING OIL; HYDRAULIC OIL

CREATION DATE: Jan 24 2000