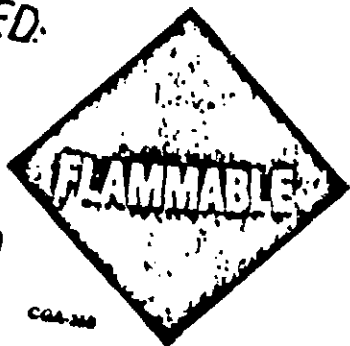


ACCEPTED
JUN 08 1983
Under the Federal Insecticide,
Fungicide, and Rodenticide Act,
as amended, for the pesticide
registered under 10336-1
EPA Reg. No.

COMPRESSED
GAS N.O.S.
UN1954

OXYFUME® 20
8750-0200 (2/42)



STERILANT - FUMIGANT GAS
ACTIVE INGREDIENT - ETHYLENE OXIDE
20% BY WEIGHT
INERT INGREDIENT - CARBON DIOXIDE
80% BY WEIGHT
NET CONTENTS - 75 LBS (34.0 Kg)



MADE SPECIALTY GASES

BEFORE USING PRODUCT, READ WARNING LABEL ON SIDE OF CYLINDER

OXYFUME[®] 20

STERILANT - FUMIGANT GAS

ACTIVE INGREDIENT - ETHYLENE OXIDE 20% BY WEIGHT
INERT INGREDIENT - CARBON DIOXIDE 80% BY WEIGHT

DANGER! EXTREMELY FLAMMABLE HIGH PRESSURE LIQUID AND GAS. MAY FORM EXPLOSIVE MIXTURES WITH AIR. HARMFUL IF INHALED. CAUSES EYE AND SKIN BURNS. SUSPECT CANCER HAZARD.

ODOR: ETHER-LIKE

TLV (Ethylene Oxide): 10 PPM (1982 ACGIH)

Keep away from heat, flame and sparks. Do not breathe gas. Do not get in eyes, on skin, or clothing. Use only in a closed system. Store and use with adequate ventilation. No part of the cylinder may be exposed above 125°F (52°C). Close valve when not in use and when empty. Use in accord with tag attached to valve, Linde Form L-4703 (MSDS) and safe practices booklet L-3499.

FIRST AID: IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. IN CASE OF CONTACT, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing or shoes. Call a physician. Discard contaminated clothing or shoes.

LEAK: Evacuate area and keep personnel upwind. Shut off all sources of ignition. Use self-contained breathing apparatus and protective clothing and shut off leak if without risk.

FIRE: Do not extinguish burning gas if flow cannot be shut off immediately. Use water spray or fog nozzle to keep cylinder cool. Move cylinder away from fire if without risk.

IN EMERGENCY: Call CHEMTREC 800-424-9300

FOR INDUSTRIAL USE ONLY.

Union Carbide Corporation—Linde Division, Danbury, CT 06817

DOT Shipping Name: Compressed Gas N.O.S. UN1954

IMO Shipping Name: Liquefied Gas N.O.S. UN1954

EPA Reg. No. 10330-1

EPA Est. No. 10330-

STB-0300 (3/83)

ACCEPTED

JUN 08 1993

U.S. Department of Health and Human Services
Environmental Protection Agency
Office of Pesticide Programs
Registration Division
EPA Reg. No. 10330-1

LINDE SPECIALTY GASES

DO NOT REMOVE THIS LABEL

DO NOT DETACH THIS TAG

OXYFUME® 20 FUMIGANT GAS

20% BY WEIGHT ETHYLENE OXIDE 20% BY WEIGHT
80% BY WEIGHT CARBON DIOXIDE 80% BY WEIGHT

FOR USE

EXTREMELY FLAMMABLE

Use only by persons experienced in Oxyfume® 20 gas sterilization and fumigation. Use only in accordance with the instructions given on this tag and the safety precautions listed in the Oxyfume® 20 Material Safety Data Sheet Form (MSDS) and the Oxyfume® 20 MSDS-103499 for additional safety information.

GENERAL INFORMATION

This gas is a mixture of ethylene oxide and carbon dioxide. It is a colorless, odorless gas.

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FUMIGATION

1. Fumigation with Oxyfume® 20 must be performed only in vacuum or gastight chambers designed for use with 20% by weight Ethylene Oxide and 80% by weight Carbon Dioxide.
2. Ventilate fumigated area before entering. Aerate fumigated materials before use.

FOOD TREATMENT 21 CFR 183.200

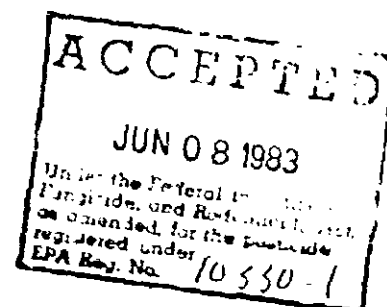
"Ethylene oxide may be safely used as a fumigant for the control of microorganisms and insect infestation in ground spices and other processed natural seasoning materials except mixtures to which salt has been added."

"Ethylene oxide, either alone or admixed with carbon dioxide or dichlorodifluoromethane, shall be used in amounts not to exceed that required to accomplish the intended technical effects."

Union Carbide Corporation—Linde Division, Danbury, CT 06817

SPECIALTY GASES

STT-0300 (3-83)



MATERIAL SAFETY DATA SHEET

L 4703 A

(Essentially similar to U.S. Department of Labor Form OSHA 201)
Revised 12/82
Do Not Duplicate This Form. Request an Original.

I. PRODUCT IDENTIFICATION

PRODUCT	Ethylene Oxide, 20% in Water, Liquid, Pressurized		
CHEMICAL NAME	SYNONYMS	Ethylene Oxide, 20% in Water	
FORMULA	CHEMICAL FAMILY		
	MOLECULAR WEIGHT		
TRADE NAME	OXCELM 20		

II. HAZARDOUS INGREDIENTS

For mixtures of this product request the respective component Material Safety Data Sheets
See Section IX

MATERIAL	WT. %	1982 ACGIH TLV TWA (Units)
Ethylene Oxide	20	10 ppm (20 mg/m ³) Limit A2 (1982) Limit of intended exposure
Carbon Dioxide	80	5,000 ppm (9,000 mg/m ³) Note: Currently, Union Carbide Corp. has established for its own use a TLV TWA of 5 ppm

ACCEPTED
JUN 08 1983
Under the FIFRA Act,
Fertilizers, and Pesticides
are classified for the pesticide
registered under
EPA Reg. No. 16330-1

III. PHYSICAL DATA

BOILING POINT, 760 mm Hg	FREEZING POINT
SPECIFIC GRAVITY (H ₂ O = 1)	VAPOR PRESSURE AT 20 C
VAPOR DENSITY (air = 1)	SOLUBILITY IN WATER, by wt
PERCENT VOLATILES BY VOLUME	EVAPORATION RATE (Butyl Acetate = 1)
APPEARANCE AND ODOR	

EMERGENCY PHONE NUMBER

CASE OF EMERGENCY

Union Carbide Corporation requests the users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information; (2) furnish this same information to each of its customers for the product; and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

UNION CARBIDE CORPORATION - LINDE DIVISION
Old Ridgebury Road, Danbury, CT 06817

L 4703 A

PRODUCT:

L 4703-A

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT: ALL

EFFECTS OF OVEREXPOSURE AND EMERGENCY AND FIRST AID PROCEDURES

Due to the presence of ethylene oxide in this mixture the full text of the Health Hazards section of the EO Material Safety Data Sheet is repeated below.

ACUTE EFFECTS OF OVEREXPOSURE

SWALLOWING: A person who swallows a small amount of this mixture may experience irritation of the mouth, throat, and abdominal pain, nausea, vomiting, and diarrhea.

INHALATION: Irritation of the eyes, nose, and throat, headache, nausea, vomiting, diarrhea, coughing, chest tightness, cyanosis, weakness, drowsiness, loss of coordination, and coma. Delayed onset pulmonary edema may occur.

SKIN: Absorption by contact with the skin is unlikely, but could lead to headache, dizziness, nausea, and vomiting. Contact with liquid can lead to delayed onset of erythema, edema, vesication, and blister formation. Usually several hours to onset.

EYES: Burns from liquid, irritation from vapor.

CHRONIC EFFECTS OF OVEREXPOSURE

Ethylene Oxide is mutagenic. Animals exposed to Ethylene Oxide Vapor for up to 2 years have shown an increase in the incidence of malignant tumors compared with controls. Ethylene Oxide should be regarded as a suspect cancer agent.

OTHER HEALTH HAZARDS

Allergic contact dermatitis may occur. A few cases of neuropathy (mainly peripheral) have been described from recurrent exposure to high vapor concentrations.

EMERGENCY AND FIRST AID PROCEDURES

SWALLOWING: Drink a glass of water and induce vomiting. Call a physician.

INHALATION: Remove to fresh air. Did administer oxygen if breathing is difficult. Observe for vomiting. If breathing stops, start artificial respiration, preferably with the simultaneous administration of oxygen. Call a physician.

SKIN: Immediately remove contaminated clothing and wash skin copiously with soap and water. Contact a physician if irritation persists or blisters form.

EYES: Flush immediately with water and continue for at least 15 minutes. Contact an ophthalmologist immediately.

NOTE: Aerate-contaminated clothing, then wash clothing before re-use. Destroy contaminated leather articles, such as shoes and gloves.

NOTES TO PHYSICIAN

1. Persons exposed to Ethylene Oxide may develop severe and intractable vomiting, requiring the use of antiemetics given intravenously.
2. Prolonged or high vapor concentration exposure may result in the development of pulmonary edema after a latent phase of several hours. Also, respiratory tract injury caused by Ethylene Oxide may predispose to the development of a secondary respiratory infection. Individuals exposed to moderately high vapor concentrations of Ethylene Oxide should be retained for observation.
3. Following skin contamination, primary irritation and blister formation may be delayed in onset.

Due to the high percentage of Carbon Dioxide in this mixture the full text of the Health Hazards Section of the CO₂ Material Safety Data Sheet is repeated below:

EFFECTS OF OVEREXPOSURE AND EMERGENCY AND FIRST AID PROCEDURES

Carbon Dioxide acts as an asphyxiant by displacing oxygen, and also causes toxic symptoms when present in sufficient amounts.

SYMPTOMS: Headache, increased breathing rate, difficult breathing, perspiration, dizziness, ringing in ear, lips blue, tremors and weakness, visual disturbance, drowsiness, unconsciousness.

TREATMENT FOR ASPHYXIA: If a person is overcome by the atmosphere, clear away if breathing difficult, administer oxygen. If not breathing, give artificial respiration, preferably mouth to mouth. Call a physician.

V. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (by method)	AUTOIGNITION TEMPERATURE
FLAMMABLE LIMITS Lower Upper	Upper
EXTINGUISHING MEDIA	

SPECIAL FIRE FIGHTING PROCEDURES

Evacuate personnel from danger area. Immediately cool containers with water spray from maximum distance taking care not to extinguish flames. Remove ignition sources if without risk. If flames are accidentally extinguished, explosive re-ignition may occur. Use self-contained breathing apparatus where necessary. Stop flow of gas if without risk, while continuing cooling water spray. Remove all containers from area of fire if without risk. Allow fire to burn out.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Flammable mixture. May form explosive mixtures with air and oxidizing agents. Do not extinguish flames due to possibility of explosive re-ignition. Flammable vapors may spread from spill. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with appropriate device. No part of a container should be subjected to a temperature higher than 52°C (approximately 125°F). Containers are provided with pressure relief devices that are designed to vent the contents when they are exposed to elevated temperatures.

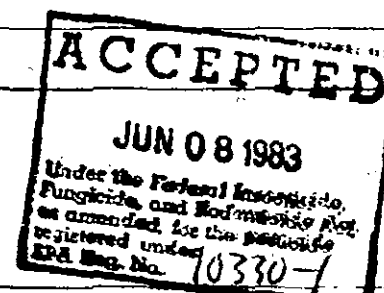
VI. REACTIVITY DATA

STABILITY	CONDITIONS TO AVOID
UNSTABLE STABLE	Temperatures above 430°C (approximately 800°F).
X	

INCOMPATIBILITY (materials to avoid) Alkalies and acids

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition may produce carbon monoxide and/or carbon dioxide.



HAZARDOUS POLYMERIZATION	CONDITIONS TO AVOID
May Occur Will not Occur	Trace polymers may be present under ordinary conditions of temperature, pressure, etc. However, ethylene oxide will polymerize violently if contaminated with aqueous alkalis, amines, mineral acids, metal chlorides or metal oxides.
X	

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

DANGER: May form explosive mixtures with air (see Section V). Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if without risk. Reduce vapors with fog or fine water spray. Shut off leak if without risk. Ventilate area of leak or move leaking assembly to well-ventilated area.

Flammable vapors may spread from spill. Before entering area, especially confined areas, check atmosphere with appropriate device.

WASTE DISPOSAL METHOD Discard any product, residue, disposable container or liner in an environmentally acceptable manner in full compliance with federal, state, and local regulations. Ethylene Oxide is highly toxic to most forms of life and is considered a potential environmental pollutant. Indiscriminate dumping into sewers or water ways must be avoided.

PRODUCT

OXYFUME[®] 20 (Liquefied Gas Mixture Under Pressure)

L 4703-A

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)

Self-contained breathing apparatus approved for use

VENTILATION	LOCAL EXHAUST <i>Prohibited</i>
	MECHANICAL (general) <i>Acceptable</i>
	SPECIAL
	OTHER

PROTECTIVE GLOVES

Neoprene

EYE PROTECTION

Full face shield and safety glasses or equivalent goggles

OTHER PROTECTIVE EQUIPMENT

Metatarsal shoes for cylinder handling; safety shower; eye wash fountain. Rubber shoes and apron when risk of liquid spill exists.

IX. SPECIAL PRECAUTIONS

DANGER: Flammable, liquefied gas mixture under pressure. May form explosive mixtures with air. Do not breathe vapor. Can cause rapid suffocation due to oxygen deficiency. Avoid contact with eyes, skin or clothing. Safety showers and eyewash fountains should be immediately available. Use piping and equipment adequately designed to withstand pressures to be encountered. Ground all equipment. Only use spark proof tools and explosion proof equipment. Keep away from heat, sparks and open flame. Store and use with adequate control of catalysts. Use only in a closed system. Close valve when not in use and when empty.

It may be feasible to convert aqueous solutions of ethylene oxide to the gaseous form under the correct conditions of pH, temperature and pressure and disposal of gaseous ethylene oxide by incineration. EO will evolve from water solutions. See Section VIII, Ventilation.

BIOLOGICAL TREATMENT: Ethylene oxide is a highly toxic material. It should be handled by biological waste treatment facilities under controlled conditions after proper decontamination.

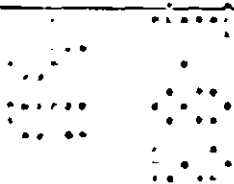
Contaminated rubber gloves and rubber clothing should be removed and stored for several days before cleaning and reuse.

MIXTURES: When two or more gases or liquid gases are mixed, their physical properties may combine to create additional unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an expert in the field of gas mixtures before you make your safety evaluation of the final product. Remember that the physical properties of mixtures can cause serious injury or death.

WARNING: Be sure to read and handle this product in accordance with the instructions on the container of this product.

OTHER HANDLING AND STORAGE CONDITIONS: Do not work in an open end system. If there is a leak, close the cylinder valve, blow down the system, vent to atmosphere and repair the equipment.

The opinions expressed herein are those of qualified experts within Union Carbide Corporation. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of Union Carbide Corporation, it is user's obligation to determine the conditions of safe use of the product.



UNION CARBIDE CORPORATION
LINDE DIVISION

GENERAL OFFICES: DANBURY, CT
OFFICES IN PRINCIPAL CITIES

L 4703-A 83/09/8 483 5M

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