

Section 1: Product and Company Identification

Minneapolis Oxygen Company

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CONTRACT #529

Product Code: Ethylene

Section 2: Hazards Identification



Danger

Hazard Classification:

Flammable (Category 1)
Gases Under Pressure
Specific target organ toxicity (Single Exposure) (Category 3)

Hazard Statements:

Contains gas under pressure; may explode if heated
Extremely flammable gas
May cause respiratory irritation;

Precautionary Statements

Prevention:

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Use only outdoors or in a well-ventilated area.
Avoid breathing dust/fume/gas/mist/ vapors/spray.
[In case of inadequate ventilation] wear respiratory protection.

Response:

If inhaled: Remove person to fresh air and keep comfortable for breathing.
Eliminate all ignition sources if safe to do so.
Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Call a poison center or doctor if you feel unwell.

Storage:

Store locked up.
Protect from sunlight.
Store in a well-ventilated place. Keep container tightly closed.

Disposal:

Dispose of contents and/or container in accordance with applicable regulations.

Section 3: Composition/Information on Ingredients

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|--------------|
| CAS # |
| 74-85-1 |

| Chemical Substance | Chemical Family | Trade Names |
|--------------------|--------------------------------------|--|
| Ethylene | Hydrocarbons, Aliphatic, Unsaturated | ACETENE; ETHENE; ETHYLENE, COMPRESSED GAS; OLEFIANT GAS; BICARBURETTED HYDROGEN; UN 1962; C2H4 |

Section 4: First Aid Measures

| Skin Contact | Eye Contact | Ingestion | Inhalation | Note to Physicians |
|--|---|--|--|----------------------------------|
| If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention. | Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention. | Do not induce vomiting. Seek immediate medical attention. Check for frostbite. Thaw frostbite slowly with lukewarm water. Avoid mouth-to-mouth contact by using a mouth shield or guard to perform artificial respiration. | If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention. | For inhalation, consider oxygen. |

Section 5: Fire Fighting Measures

| Suitable Extinguishing Media | Products of Combustion | Protection of Firefighters |
|--|--|--|
| Carbon dioxide, regular dry chemical Large fires: Flood with fine water spray. | Carbon monoxide, carbon dioxide and toxic and irritating fumes | <ul style="list-style-type: none"> ▪ Any self-contained breathing apparatus with a full facepiece. ▪ Any self-contained breathing apparatus with a full facepiece. |

Section 6: Accidental Release Measures

| Personal Precautions | Environmental Precautions | Methods for Containment |
|---|---|--|
| Keep unnecessary people away, isolate hazard area and deny entry. Do not touch spilled material. Ventilate closed spaces before entering. | Avoid heat, flames, sparks and other sources of ignition. | Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition. |

| Methods for Cleanup | Other Information |
|---|-------------------|
| Avoid ignition sources. Evacuate area, contact emergency personnel. Use fine water spray. | None |

Section 7: Handling and Storage

| Handling | Storage |
|----------|---------|
|----------|---------|

| Handling | Storage |
|---|---|
| Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store in a cool, dry place. Store in a well-ventilated area. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances. | Avoid heat, flames, sparks and other sources of ignition. Grounding and bonding required. |

Section 8: Exposure Controls/Personal Protection

| Exposure Guidelines |
|--|
| TLV-TWA: 200ppm Carcinogenicity Designation A4 (ACGIH) |

Engineering Controls

Handle only in fully enclosed systems.

| Eye Protection | Skin Protection | Respiratory Protection |
|--|--|---|
| For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area. | For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing. | Any self-contained breathing apparatus with a full facepiece. |

General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

Section 9: Physical and Chemical Properties

| Physical State | Appearance | Color | Change in Appearance | Physical Form | Odor | Taste |
|----------------|------------|-----------|----------------------|----------------|------------|-------------|
| Gas | Colorless | Colorless | N/A | Compressed gas | Sweet odor | Sweet taste |

| Flash Point | Flammability | Partition Coefficient | Autoignition Temperature | Upper Explosive Limits | Lower Explosive Limits |
|---|---------------|---|--------------------------|------------------------|------------------------|
| Approximately -212.8 F (-136 C) (CC); extremely flammable gas | Not available | 281.84 (log = 2.45) (estimated from water solubility) | 842 F (450 C) | 0.36 | 0.027 |

| Boiling Point | Freezing Point | Vapor Pressure | Vapor Density | Specific Gravity | Water Solubility | pH | Odor Threshold | Evaporation Rate | Viscosity |
|-----------------|-----------------|-------------------|--|------------------|------------------|----------------|---|------------------|---|
| -155 F (-104 C) | -272 F (-169 C) | 760 mmHg @ -104 C | 0.978 @ 0 C; 0.969 @ 21.1 C (air = 1) | Not applicable | 0.226 | Not applicable | Wide range of reported values: 17 to 959 ppm. Acceptable values are: 270 ppm (310 mg/m3) (detection); 418 ppm (480 mg/m3) (recognition) | Not applicable | LIQUEFIED GAS: 0.16 mPa.s (0.16 centipoise) @ -100 C (18); 0.07 mPa.s (0.07 centipoise) @ 0 C |

| Molecular Weight | Molecular Formula | Density | Weight per Gallon | Volatility by Volume | Volatility | Solvent Solubility |
|------------------|-------------------|-----------------|-------------------|----------------------|------------|---|
| 28.05 | C-H2-C-H2 | 1.261 g/L @ 0 C | Not available | 100% | 1 | Soluble: Alcohol, ether, acetone, benzene |

Section 10: Stability and Reactivity

| Stability | Conditions to Avoid | Incompatible Materials |
|-----------|---------------------|------------------------|
| | | |

| Stability | Conditions to Avoid | Incompatible Materials |
|---|---|---|
| May polymerize. Avoid storage and use above room temperature. | May polymerize. Avoid storage and use above room temperature. | Acids, metal salts, halogens, halo carbons, oxidizing materials, metals, peroxides, chlorine, aluminum chloride, nitrogen dioxide or ozone, copper, 5A molecular sieves |

| Hazardous Decomposition Products | Possibility of Hazardous Reactions |
|---|---|
| Carbon monoxide, carbon dioxide, hydrocarbons | Polymerizes with evolution of heat. Store in a cool, dry place. |

Section 11: Toxicology Information

Acute Effects

| Oral LD50 | Dermal LD50 | Inhalation |
|-----------------------------------|---------------|--|
| LC50 (inhalation, mouse) = 96 pph | Not available | Nausea, vomiting, symptoms of drunkenness, bluish skin color, suffocation, convulsions, coma |

| Eye Irritation | Skin Irritation | Sensitization |
|---------------------------|---------------------|--|
| Frostbite, blurred vision | Blisters, frostbite | Specific Target Organ Toxicity (single exposure), Category 3; H336: May cause drowsiness or dizziness. |

Chronic Effects

| Carcinogenicity | Mutagenicity | Reproductive Effects | Developmental Effects |
|---|---------------|----------------------|-----------------------|
| IARC: Human Inadequate Evidence, Animal Inadequate Evidence, Group 3; ACGIH: A4 -Not Classifiable as a Human Carcinogen | Not available | Not available | No data |

Section 12: Ecological Information

Fate and Transport

| Eco toxicity | Persistence / Degradability | Bioaccumulation / Accumulation | Mobility in Environment |
|--|---|--|--|
| Fish toxicity: 22000-25000 ug/L 1 day(s) LC100 (Mortality) Orangespotted sunfish (Lepomis humilis) Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Lemon = 0.025-0.05; epinasty Other toxicity: Tomato = 0.04-0.1 ppm/3-48 hours; leaf epinasty. | Relatively non-persistent in the environment. Moderately volatile from water. | Accumulates very little in the bodies of living organisms. | Leaches through the soil or the sediment at a slow rate. |

Section 13: Disposal Considerations

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

| Proper Shipping Name | ID Number | Hazard Class or Division | Packing Group | Labeling Requirements | Passenger Aircraft or Railcar Quantity Limitations | Cargo Aircraft Only Quantity Limitations | Additional Shipping Description |
|----------------------|-----------|--------------------------|----------------|-----------------------|--|--|---------------------------------|
| Ethylene | UN1962 | 2.1 | Not applicable | 2.1 | Forbidden | 150 kg | N/A |

Canadian Transportation of Dangerous Goods

| Shipping Name | UN Number | Class | Packing Group / Risk Group |
|----------------------|-----------|-------|----------------------------|
| Ethylene, compressed | UN1962 | 2.1 | Not applicable |

Section 15: Regulatory Information

U.S. Regulations

| CERCLA Sections | SARA 355.30 | SARA 355.40 |
|-----------------|----------------|----------------|
| Not regulated. | Not regulated. | Not regulated. |

SARA 370.21

| Acute | Chronic | Fire | Reactive | Sudden Release |
|-------|---------|------|----------|----------------|
| Yes | No | Yes | Yes | Yes |

SARA 372.65

ETHYLENE

OSHA Process Safety

Not regulated.

State Regulations

| CA Proposition 65 |
|-------------------|
| Not regulated. |

Canadian Regulations

| WHMIS Classification |
|----------------------|
| A, B1, D2B |

National Inventory Status

| US Inventory (TSCA) | TSCA 12b Export Notification | Canada Inventory (DSL/NDL) |
|----------------------|------------------------------|----------------------------|
| Listed on inventory. | Not listed. | Listed on inventory. |

Section 16: Other Information

| NFPA Rating |
|------------------------------|
| HEALTH=3 FIRE=4 REACTIVITY=2 |

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard