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Ethylene Oxide Handling

Completely Read this Guide prior to handling containers.

Do not use this product without fully reading and understanding the Label, the current MSDS, and the OSHA Ethylene Oxide Standard (29 CFR 1910.1047). Only properly trained personnel should handle Ethylene Oxide. All facilities using Ethylene Oxide must have an emergency plan.

Unloading Ethylene Oxide Drums From Truck

1. Engine must be shut off unless using pump for lift-gate.
2. Handbrake must be set, wheels chocked, and precautions taken to prevent vehicle from moving.
3. Prevent all smoking, open flames, and combustion sources in or near the vehicle and the loading/unloading area.
4. Use caution when entering the trailer. If a leak is suspected, get emergency response advice immediately. Chemtrec phone: 1-800-424-9300.
5. Equipment that is likely to damage the container cannot be used. Drums should always be handled carefully to prevent damage.

Storage Drums

1. All areas used for loading/unloading or storage of Ethylene Oxide are considered Class 1, Group B, Division 2, as defined by the National Electrical Code.
2. Storage, unloading and loading areas must be posted with "No Smoking" signs, with access restricted per the OSHA Ethylene Oxide Standard (29 CFR 1910.1047).
3. Store upright in a cool, dry, well-ventilated area, especially in warm climates.
4. Store under a roof to keep drums out of direct sunlight.

Handling of Ethylene Oxide Drums

1. DO NOT use a forklift to move drums: DO NOT use a forklift in an immediate area if there maybe any possibility that EO vapors may be present.
2. DO NOT roll the drums or bang them together.
3. DO NOT use equipment that is capable of damaging the drums.
4. DO NOT mark the drums in any way. Use wire twist-on tags rather than adhesive labels.
5. There should always be an adequate source of ventilation.

Unloading EO Drum Contents

1. Only use spark-proof tools (such as brass or beryllium-copper) to remove plugs or operate valves. Do not use tools to operate valves that are outfitted with handwheels.
2. Always inspect equipment prior to making connections. Ensure that all connections meet CGA requirements; are in good working order; and when connected to valves, provide a leak-free connection. Use of Teflon tape is not recommended as particle matter may enter the drum.
3. Only use nitrogen as an inert gas to unload the drum contents.
4. Heat generating conditions increase the explosion hazard & Polymer formation.
5. When unloading EO from the drum, there should be a constant nitrogen pressure using the attached charts as a guide. The discharge valve regulates the flow of liquid.
6. All piping should be made of steel, nickel (Clad), or Stainless Steel.
7. Check valves should be installed in the discharge line to prevent reactants from entering the drum.
8. The normal working pressure for unloading a drum is 50 psig. Total gas pressure per the attached chart should be left in the drum during storage. Pressure in the drums must never exceed 50 psig. Drum temperature is equivalent to ambient temperature.
9. When disconnecting, valves should be hand tightened, as over-tightening could cause damage or difficulty in re-opening of the valve.

Ethylene Oxide Handling Continued

General Guide for Return of Empty Ethylene Oxide Drums

1. Drums should contain pressure according to "recommended inerting policy." Nitrogen pressure per the attached chart should be left in the drum for return to shipper. Pressure in drums must never exceed 50 psig, and no air should be allowed to enter a drum.
2. Drums should be clearly tagged with return address.
3. Applicable DOT labeling, placarding and shipping paper requirements must be met.
4. Drums are to be returned by a carrier specified by ARC.
5. Prior to shipping, insure valves are closed (hand-tight), and that valve plugs are installed (tool-tight). Inspect containers prior to return to insure that they are properly marked and that there is no damage or leak.
6. Drums must be in proper condition for transportation, set upright and braced to prevent movement during transit, as per DOT regulations. Truck must be properly placarded and shipping paperwork must be correct.
7. Drums that are returned contain residual material, and are considered hazardous. Facilities that return drums are the official shippers of record, and must be registered with the DOT as shippers of hazardous materials.

Recommended Inerting Policy

Chart of unloading temperature of Ethylene Oxide as determined by outside ambient temperature and corresponding required pressure, using nitrogen as a diluent.

(° F)	(PSIG)	(° F)	(PSIG)
40 & Below	33	60	41
41	33	61	41
42	33	62	41
43	34	63	42
44	34	64	42
45	34	65	43
46	35	66	43
47	35	67	44
48	35	68	44
49	36	69	45
50	36	70	45
51	36	71	46
52	37	72	46
53	37	73	47
54	38	74	47
55	38	75	48
56	39	76	48
57	39	77	49
58	40	78 & Above	50
59	40		

For Emergency Information: Call CHEMTREC at 1-800-424-9300

Due to hazardous properties of Ethylene Oxide, we urge you to advise all personnel handling our containers of these guidelines.

This is only a guide. Always ensure that ethylene oxide regulations for OSHA (29CFR1910.1047) as well as other applicable Federal, State, and Local regulations are followed. Make available and be familiar with ARC's current MSDS and the North American Emergency Response Guidebook. Ethylene Oxide, including residual product is a hazardous material: Users must comply with all DOT HAZMAT shipping and handling regulations.

ARC's current MSDS is available online at www.arcspecialtyproducts.com.