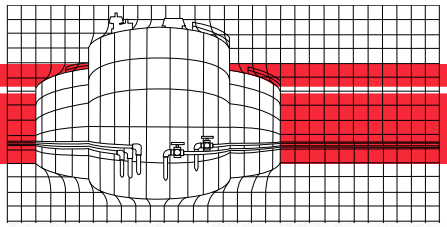

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Summary of Code of Federal Regulations (40 CFR)

Control of Emission Sources from Storage Vessels and Related Equipment in Hazardous Material Service

Code of Federal Regulations (CFR): Title 40 - Protection of Environment

Title 40 of the Code of Federal Regulations (CFR) establishes guidelines through which the nation's environment is constantly evaluated and protected from deterioration. Among the major subjects covered in Title 40 are noise abatement, ocean dumping, radiation protection and water programs. Perhaps the most publicized section of Title 40 is Subchapter C - "Air Programs". Included in Subchapter C are thirty-nine subcategories numbered in the range from Part 50 to Part 95. The definitions, procedures, regulations and authorizations through which the quality of ambient air in the United States is to be maintained and improved are listed in these parts of Subchapter C.

This article provides a summary of 40 CFR Subchapter C focusing particularly on sections that deal with the processing and storage of hazardous and volatile liquids and the methods by which vapors generated from these materials are to be controlled and prohibited from release into the atmosphere as pollutants. Excerpts from specific marked [*] CFR sections referenced in this summary may be found in the "Excerpts from Regulations - 40 CFR Subchapter C - Air Programs" on page 4.

Part 50 - National Primary and Secondary Ambient Air Quality Standards

In Part 50 of 40 CFR, the scope and goals of the "Air Programs" are specified. "National Primary Ambient Air Quality Standards" are defined as the levels of air quality that are necessary to protect the public health. "National Secondary Ambient Air Quality Standards" are the levels of air quality that protect the public from any known or anticipated adverse effects of pollutants. The standards are intended to set minimum levels of air quality required to protect the air we breathe. The regulations have been developed not only to improve air quality, but also to insure against the deterioration of air quality. If some region of the United States currently meets minimum standards, they are not allowed to simply ignore polluting activities until the national standards are violated. In fact, individual States are free to establish more stringent standards than those imposed by the Federal Government **[40 CFR 50.2*].**

Part 51- Requirements for Preparation, Adoption and Submittal of Implementation Plans & Part 52 - Approval and Promulgation of Implementation Plans

Parts 51 and 52 hold each State responsible for developing plans by which they will meet or exceed the national primary and secondary ambient air quality standards. These plans must be submitted to the Administrator of the Environmental Protection Agency (EPA) for review and acceptance. These State Implementation Plans (SIP) must include dates for attainment of standards, description of enforcement methods, procedures for handling violations and a designation of the agency responsible for enforcement of implementation. The plans may be modified and resubmitted for approval as circumstances change or as revisions to governing standards are adopted.

Part 60 - Standards of Performance for New Stationary Sources

Part 60 of 40 CFR is entitled "Standards of Performance for New Stationary Sources" where stationary sources are defined as any building, structure, facility or installation which emits or may emit any air pollutant. Guidelines are provided for the surveillance of certain industries whose operations have been judged to be a significant hindrance to the attainment of national ambient air quality standards. These problem industries are identified and ranked in their order of priority as major sources of pollutants **[40 CFR 60.16*].** The top three facilities/sources in this listing are: 1) Synthetic Organic Chemical Manufacturing Industry (SOCMI) and Volatile Organic Liquid (VOL) Storage Vessels and Handling Equipment, 2) Industrial Surface Coating: Cans, and 3) Petroleum Refineries: Fugitive Sources.

In general terms, the listing highlights the types of facilities and operations that are most likely to cause air pollution problems. It is logical that these facilities will be subjected to close scrutiny by State enforcement agencies.

Included in 40 CFR Part 60 are various subparts that define methods by which facilities or operations can work towards compliance with mandated emission standards. These subparts are identified as "emission guidelines" or "standards of performance". A full listing of the seventy-six subparts is available in the index of Part 60, but a few of the more relevant items are:

Subpart J: Standards of Performance for Petroleum Refineries

Subpart K: Standards of Performance for Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced after June 11, 1973, and Prior to May 19, 1978.

Subpart Ka: Standards of Performance for Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced after May 18, 1978, and Prior to July 23, 1984.

Subpart Kb: Standards of Performance for Storage Vessels for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984.

Subpart O: Standards of Performance for Sewage Treatment Plants

Subpart VV : Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry
Subpart XX: Standards of Performance for Bulk Gasoline Terminals
Subpart GGG: Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries
Subpart KKK: Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants

Definitions

Before looking at some of these subparts in more detail it is appropriate to list the definitions of some common terms (reference 40 CFR 60.481, 40 CFR 60.111b; 40 CFR 60.2).

Synthetic Organic Chemicals Manufacturing Industry: The industry that produces, as intermediates or final products, one or more of the chemicals listed in **[40 CFR 60.489*].**

Petroleum: Crude oil removed from the earth and the oils derived from tar sands, shale and coal.

Petroleum Liquids: Petroleum condensate, and any finished or intermediate products manufactured in a petroleum refinery.

Petroleum Refinery: Facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through distillation of petroleum, or through redistillation, cracking, extracting, or reforming of unfinished petroleum derivatives.

Volatile Organic Compound (VOC): Any organic compound which participates in atmospheric photochemical reactions, or which is measured by a reference method, an equivalent method, an alternative method, or which is determined by procedures specified under any subpart.

Volatile Organic Liquid (VOL): Any organic liquid which can emit volatile organic compounds into the atmosphere except those VOL's that the Administrator has determined do not contribute appreciably to the formation of ozone.

Storage Vessel: A tank reservoir or container used for storage of VOL.

Pressure Release: The emission of materials resulting from system pressure being greater than the set pressure of the pressure relief device.

Closed Vent System: A system that is not open to the atmosphere and that is composed of piping, connections, and, if necessary, flow inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device.

Control Device: An enclosed combustion device, vapor recovery system, or flare.

Storage Vessels

40 CFR Part 60 - Subpart Kb establishes the most recent standards of performance for volatile organic liquid storage vessels, including petroleum liquid storage vessels that were constructed, or significantly modified after July 23, 1984. The standards reference the capacity of the tanks as well as the characteristics of the liquids being stored. Tanks with capacity between 20,000 gallons and 40,000 gallons and containing VOL with vapor pressure between 4 PSIA and 11.1 PSIA: (or) tanks with capacity of 40,000 gallons and greater storing liquids with vapor pressures between 0.75 PSIA and 11.1 PSIA must have designs that conform to: 1) fixed roof tank in combination with an internal floating roof that meets strict design parameters, or 2) external floating roof tank meeting specified design parameters, or 3) fixed roof tank with a closed vent system and control device.

When the third option is employed, the closed vent system must be monitored to insure that no part of the system leaks in excess of 500 ppm to the atmosphere **[40 CFR 60.112b(a)(3)(i) & (ii)*].** The operator of the storage vessel most document that the system is leak free and is operating within the allowable emission levels **[40 CFR 60.113b(c)*].**

If a tank has a capacity of 20,000 gallons or more and contains liquids with a vapor pressure of 11.1 PSIA or more, the tank must be equipped with a closed venting system and control device **[40 CFR 60.112b(b)(1)*].**

Subpart Kb has general applicability to "newer" vessels used for the storage of many different types of liquids and chemicals. Strict emission control, design and construction parameters for the vessels are documented.

Subpart K of 40 CFR Part 60 is limited in its scope. It references vessels, storing only petroleum liquids, that were constructed or modified after June 11, 1973 and prior to May 19, 1978. This subpart requires that vessels used to store petroleum liquids with certain vapor pressure ranges must include floating roof tanks, vapor recovery units or the equivalent. The design and leakage requirements are general in nature.

Subpart Ka also covers specific vessel types. Petroleum liquid storage vessels constructed or modified after May 18, 1978 and prior to July 23, 1984 are referenced. For affected tank systems, design options are provided for floating roof tanks and fixed roof tanks with vapor recovery systems. The specific requirements relating to "closed vent systems" and measurement of parts per million leakage rates are not included.

Examination of these three subparts highlights the tendency of the EPA to adopt more stringent leakage control and monitoring requirements for new storage vessels, and to expand the applicability of these strict standards to a wider range of stored substances.

Subparts K, Ka and Kb concentrate on the design and function of storage vessels. Other subparts of 40 CFR are concerned with emissions from peripheral devices that may be associated with the vessels. Allowable emission rates through equipment, such as closed vent systems and pressure relief devices, that may be used in the petroleum and/or chemical industry are stated.

Chemical Industry Equipment

Subpart VV of 40 CFR Part 60 (Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry) is of primary importance. This subpart establishes standards of emission performance for various pieces of equipment commonly found in chemical manufacturing and processing facilities. Facility operators must inspect, verify, document and report that the leakage rates for all equipment listed is in compliance with the standards:

60.482-1 Standards: General
60.482-2 Standards: Pumps in light liquid service
60.482-3 Standards: Compressors
60.482-4 Standards: Pressure relief devices in gas/vapor service
60.482-5 Standards: Sampling connection systems
60.482-6 Standards: Open-ended valves or lines
60.482-7 Standards: Valves in gas/vapor service and in light liquid service

60.482-8 Standards: Pumps and valves in heavy liquid service, pressure relief devices in light liquid service or heavy liquid service and flanges and other connections
60.482-9 Standards: Delay of repair
60.482-10 Standards: Closed vent systems and control devices

For example, if a closed venting system is being used to reduce emissions and to comply with the requirements of the standard, it must be capable of recovering (condensers, adsorbers, etc.) or reducing (flares, enclosed combustion devices, etc.) the VOC emissions at some defined level of efficiency. The closed systems must be monitored to verify that they meet or exceed all the requirements of their design. Any leaks, as indicated by an instrument reading greater than 500 parts per million (ppm) above background, must be repaired as soon as practicable. The first attempt at repair must be made no later than five calendar days after the leak is detected. **[40 CFR 60.482-10*].**

A pressure pipe-away vent may be a component of a closed venting system. Vapors flowing from the vent must be directed to a destruction or recovery system. No leakage rates to the atmosphere in excess of 500 ppm are allowed anywhere in the closed venting system.

It is recognized that it may sometimes be necessary to relieve excessive pressure in a system so that damage from overpressurization can be avoided. Section **[40 CFR 60.482-4*]** defines the standard of operation in such cases. It states that, except during a safety required pressure release, any pressure relief device that is not equipped with a closed venting system must operate with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background. If leakage through a pressure relief device is detected, or if a pressure release occurs, the pressure relief device must be returned to a condition of no detectable emissions (less than 500 ppm) as soon as practicable, but within no more than five calendar days **[40 CFR 60.482-4*].** A large size emergency vent that relieves to atmosphere under unusual conditions, such as fire involvement of the tank, may be an example of a pressure relief device that is not connected to a closed vent system. In normal system operation, such vents (pressure relief devices) should operate with leak rates of less than 500 ppm.

Petroleum Industry Equipment

Standards of performance for equipment leaks of VOC in petroleum refineries are identified in 40 CFR Part 60 - Subpart GGG. As may be anticipated, the requirements for control of emissions from equipment sources are identical to those that apply to the chemical industries. In fact, petroleum refinery operators must comply with the equipment leakage provisions stated in 60.482-1 through 60.482-10. These are the sections referenced above in Chemical Industry Equipment. The need for such compliance in the petroleum industry is stated in **[40 CFR 60.592*].**

Method 21 - Determination of VOC Leaks

In the various subparts that have been reviewed, reference is made to leak rate measurements no greater than 500 parts per million (ppm) for pressure relief devices and closed vent systems. These measurements are made under a standardized format that is known as Method 21. Special "sniffer" instruments, calibrated to a reference gas source, are used to detect parts per million leak rates that must be verified and documented as part of the facility operating standards. See 40 CFR Part 60, Appendix A, Method 21 for more details of the process.

Part 61 - National Emission Standards for Hazardous Air Pollutants

Part 61 of 40 CFR is entitled "National Emissions Standards for Hazardous Air Pollutants" (NESHAP). While Part 60 listed pollution sources by industry types, Part 61 is concerned with specific substances that are considered to be significant, hazardous air pollutants. Subparts under Part 61 establish national emission standards for mercury, vinyl chloride, benzene, asbestos and many other substances.

Subpart V of Part 61 establishes the National Emission Standards for Equipment Leaks (Fugitive Emission Sources). This subpart is applicable to equipment that is used in services where volatile hazardous air pollutants (VHAP) are present. VHAP means a substance that is regulated under Part 61. Benzene and vinyl chloride are considered to be VHAP.

The emission standards for equipment in VHAP service once again closely parallel the requirements previously discussed for the chemical industry. Standards for storage vessels, closed vent systems, control devices and pressure relief devices require that leak rates not exceed 500 parts per million (ppm). The specific equipment references for equipment emissions in VHAP service may be found in 40 CFR 61.242-1 through 61.242-11.

Additional controls are documented in Part 63 of 40 CFR where national standards for stationary sources of such hazardous air pollutants are identified.

The Role of Individual States

Through their State Implementation Plans (SIP) individual States play the primary role in the evaluation of environmental concerns and in defining how enforcement of, and compliance with, national and local standards can best be achieved. The States must either choose to adopt the CFR sections directly, or they may develop their own equivalent, or more stringent, regulations. Regions within a State may be designated as non-attainment (exceeding the relevant emission standards) areas relative to the control of air pollutants. State enforcement agencies must determine whether or not industries in the region are taking advantage of all reasonably available control technology (RACT) to comply with requirements. The States must balance the practical limitations involved with operating various facility types against the need for achieving national ambient air quality standards. Regions, industries or emission sources may be selectively targeted in an effort to progress towards mandated standards.

In recent years, a trend towards voluntary development of pollution control plans by individual companies in cooperation with State agencies has been noted. The companies independently investigate and attempt to minimize emissions of all hazardous substance from their operations. Reports of progress and problems are freely shared with the enforcement agencies.

All of these factors are considered and incorporated into the States' implementation plan and schedule.

Summary

The Code of Federal Regulations (CFR) sections referenced and excerpted above provide the basic framework by which the quality of ambient air in the United States is to be protected from pollution sources. Emphasis has been placed on those regulations that relate to tank storage and processing of volatile organic compounds. Other parts of Title 40 may also be relevant to specific operations. For example, Part 63 (National Emission Standards for Hazardous Air Pollutants for

Source Categories) provides standards for facilities where substances designated as hazardous pollutants by the EPA Administrator are handled. The scope and detail of these standards correspond closely with those documented in 40 CFR Part 60.

A facility owner or operator must be familiar with these standards and must assume that the requirements will change. If past experience is any indication, amendments to these regulations will likely result in even more stringent emission standards, applicable to a broader range of equipment and pollution sources. Enforcement of State Implementation Plans (SIP) will require that tank storage systems and related equipment be updated to meet all applicable standards.

Excerpts from Regulations
40 CFR Subchapter C - Air Programs

40 CFR 50.2 - Scope

(a) National primary and secondary ambient air standards under Section 109 of the Act are set forth in this part.

(b) National primary ambient air quality standards define levels of air quality which the Administrator judges are necessary, with an adequate margin of safety, to protect the public health. National secondary ambient air quality standards define levels of air quality which the Administrator judges necessary to protect the public welfare from any known or anticipated adverse affects of a pollutant. Such standards are subject to revision, and additional primary and secondary standards may be promulgated as the Administrator deems necessary to protect the public health and welfare.

(c) The promulgation of national primary and secondary ambient air quality standards shall not be considered in any manner to allow significant deterioration of existing air quality in any portion of any State.

(d) The proposal, promulgation, or revision of national primary and secondary ambient air quality standards shall not prohibit any State from establishing ambient air quality standards for that State or any portion thereof which are more stringent than the national standards.

40 CFR 60.112b - Standards for Volatile Organic Compounds (VOC)

40 CFR 60.112b(a)(3)(i)&(ii)

(3) A closed vent system and control device meeting the following specifications:

(i) The closed vent system shall be designed to collect all VOC vapors and gases discharged from the storage vessel and operated with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background and visual inspections, as determined in Part 60, Subpart VV, Sec. 60.485(b).

(ii) The control device shall be designed and operated to reduce inlet VOC emissions by 95 percent or greater. If a flare is used as the control device, it shall meet the specifications described in the general control device requirements (Sec. 60.18) of the General Provisions.

40 CFR 60.113b - Testing and Procedures

40 CFR 60.113b(c)

(c) The owner or operator of each source that is equipped with a closed vent system and control device as required in Sec. 60.112b(a)(3) or (b)(2) (other than a flare) is exempt from Sec. 60.8 of the General Provisions and shall meet the following requirements.

(1) Submit for approval by the Administrator as an attachment to the notification required by Sec. 60.7(a)(1) or, if the facility is exempt from Sec. 60.7(a)(1), as an attachment to the notification required by Sec. 60.7(a)(2), an operating plan containing the information listed below.

(i) Documentation demonstrating that the control device will achieve the required control efficiency during maximum loading conditions. This documentation is to include a description of the gas stream which enters the control device, including flow and VOC content under varying liquid level conditions (dynamic and static) and manufacturer's design specifications for the control device. If the control device or the closed vent capture system receives vapors, gases, or liquids other than fuels from sources that are not designated sources under this Subpart, the efficiency demonstration is to include consideration of all vapors, gases and liquids received by the closed vent capture system and control device. If an enclosed combustion device with a minimum residence time of 0.75 seconds and a minimum temperature of 816 deg. C is used to meet the 95 percent requirement, documentation that those conditions will exist is sufficient to meet the requirements of this paragraph.

(ii) A description of the parameter or parameters to be monitored to ensure that the control device will be operated in conformance with its design and an explanation of the criteria used for selection of that parameter (or parameters).

(2) Operate the closed vent system and control device and monitor the parameters of the closed vent system and control device in accordance with the operating plan submitted to the Administrator in accordance with paragraph (c)(1) of this Section unless the plan was modified by the Administrator during the review process. In this case, the modified plan applies.

(d) The owner or operator of each source that is equipped with a closed vent system and a flare to meet the requirements in Sec. 60.112b(a)(3) or (b)(2) shall meet the requirements as specified in the general control device requirements, Sec. 60.18(e) and (f).

40 CFR 60.16- Priority List

Prioritized [1] Major Source Categories

1. Synthetic Organic Chemical Manufacturing Industry (SOCMI) and Volatile Organic Liquid Storage Vessels and Handling Equipment
   (a) SOCMI Unit Processes
   (b) Volatile Organic Liquid (VOL) Storage Vessels and Handling Equipment
   (c) SOCMI Fugitive Sources
   (d) SOCMI Secondary Sources
2. Industrial Surface Coating: Cans
3. Petroleum Refineries: Fugitive Sources
4. Industrial Surface Coating: Paper
5. Dry Cleaning
   (a) Perchloroethylene
   (b) Petroleum Solvent
6. Graphic Arts
7. Polymers and Resins: Acrylic Resins
8. Mineral Wool (Deleted)
9. Stationary Internal Combustion Engines
10. Industrial Surface Coating: Fabric
11. Industrial, Commercial, Institutional Steam Generating Units

12. Incineration: Non-Municipal (Deleted)
13. Non-Metallic Mineral Processing
14. Metallic Mineral Processing
15. Secondary Copper (Deleted)
16. Phosphate Rock Preparation
17. Foundries: Steel and Gray Iron
18. Polymers and Resins: Polyethylene
19. Charcoal Production
20. Synthetic Rubber
    (a) Tire Manufacture
    (b) SBR Production
21. Vegetable Oil
22. Industrial Surface Coating: Metal Coil
23. Petroleum Transportation and Marketing
24. By-Product Coke Ovens
25. Synthetic Fibers
26. Plywood Manufacture
27. Industrial Surface Coating: Automobiles
28. Industrial Surface Coating: Large Appliances
29. Crude Oil and Natural Gas Production
30. Secondary Aluminum
31. Potash (Deleted)
32. Lightweight Aggregate Industry: Clay, Shale, and Slate [2]
33. Glass
34. Gypsum
35. Sodium Carbonate
36. Secondary Zinc (Deleted)
37. Polymers and Resins: Phenolic
38. Polymers and Resins: Urea-Melamine
39. Ammonia (Deleted)
40. Polymers and Resins: Polystyrene
41. Polymers and Resins: ABS-SAN Resins
42. Fiberglass
43. Polymers and Resins: Polypropylene
44. Textile Processing
45. Asphalt Processing and Asphalt Roofing Manufacture
46. Brick and Related Clay Products
47. Ceramic Clay Manufacturing (Deleted)
48. Ammonium Nitrate Fertilizer
49. Castable Refractories (Deleted)
50. Borax and Boric Acid (Deleted)
51. Polymers and Resins: Polyester Resins
52. Ammonium Sulfate
53. Starch
54. Perlite
55. Phosphoric Acid: Thermal Process (Deleted)
56. Uranium Refining
57. Animal Feed Defluorination (Deleted)
58. Urea (for fertilizer and polymers)
59. Detergent (Deleted)

Other Source Categories:

Lead Acid Battery Manufacture [3]
Organic Solvent Cleaning [3]
Industrial Surface Coating: Metal Furniture [3]
Stationary Gas Turbines [4]
Municipal Solid Waste Landfills [4]

[1] Low numbers have highest priority, e.g., No. 1 is high priority, No. 50 is low priority.

[2] Formerly titled “Sintering: Clay and Fly Ash”.

[3] Minor source category, but included on list since an NSPS is being developed for that source category.

[4] Not prioritized, since an NSPS for this major source category has already been promulgated.

40 CFR Subpart VV - Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry

40 CFR 60.482-4 Standards: Pressure Relief Devices in Gas / Vapor Service

(a) Except during pressure releases, each pressure relief device in gas / vapor service shall be operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as determined by the methods specified in Sec. 60.485(c).

(b) (1) After each pressure release, the pressure relief device shall be returned to a condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as soon as practicable, but no later than 5 calendar days after the pressure release, except as provided in Sec. 60.482-9.

(2) No later than 5 calendar days after the pressure release, the pressure relief device shall be monitored to confirm the conditions of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, by the methods specified in Sec. 60.485(c).

(c) Any pressure relief device that is equipped with a closed vent system capable of capturing and transporting leakage through the pressure relief device to a control device as described in Sec. 60.482-10 is exempted from the requirements of paragraphs (a) and (b).

40 CFR 60.482-10 Standards: Closed Vent Systems and Control Devices

(a) Owners or operators of closed vent systems and control devices used to comply with provisions of this Subpart shall comply with the provisions of this section.

(b) Vapor recovery systems (for example, condensers and adsorbers) shall be designed and operated to recover the VOC emissions vented to them with an efficiency of 95 percent or greater.

(c) Enclosed combustion devices shall be designed and operated to reduce the VOC emissions vented to them with an efficiency of 95 percent or greater, or to provide a minimum residence time of 0.75 seconds at a minimum temperature of 816 deg. C.

(d) Flares used to comply with this subpart shall comply with the requirements of Sec. 60.18.

(e) Owners or operators of control devices used to comply with the provisions of this subpart shall monitor these control devices to ensure that they are operated and maintained in conformance with their designs.

(f) Except as provided in paragraphs (i) through (k) of this section, each closed vent system shall be inspected according to the procedures and schedule specified in paragraphs (f)(1) and (f)(2) of this section.

(1) If the vapor collection system or closed vent system is constructed of hard piping, the owner or operator shall comply with the requirements specified in paragraphs (f)(1)(i) and (f)(1)(ii) of this section:

(i) Conduct an initial inspection according to the procedures in Sec. 60.485(b); and
(ii) Conduct annual visual inspections for visible, audible, or olfactory indications of leaks.

(2) If the vapor collection system or closed vent system is constructed of ductwork, the owner or operator shall;
(i) Conduct an initial inspection according to the procedures in Sec. 60.485(b); and
(ii) Conduct annual inspections according to the procedures in Sec. 60.485(b).

(g) Leaks, as indicated by an instrument reading greater than 500 parts per million by volume above background or by visual inspections, shall be repaired as soon as practicable except as provided in paragraph (h) of this section.
(1) A first attempt at repair shall be made no later than 5 calendar days after the leak is detected.
(2) Repair shall be completed no later than 15 calendar days after the leak is detected.

(h) Delay of repair of a closed vent system for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be completed by the end of the next process unit shutdown.

(i) If a vapor collection system or closed vent system is operated under a vacuum, it is exempt from the inspection requirements of paragraphs (f))(1)(i) and (f)(2) of this section.

(j) Any parts of the closed vent system that are designated, as described in paragraph (l)(1) of this section, as unsafe to inspect are exempt from the inspection requirements of paragraphs (f)(1)(i) and (f)(2) of this Section if they comply with the requirements specified in paragraphs (j)(1) and (j)(2) of this section:
(1) The owner or operator determines that the equipment is unsafe to inspect because inspecting personnel would be exposed to an imminent or potential danger as a consequence of complying with paragraphs (f)(1)(i) or (f)(2) of this section; and
(2) The owner or operator has a written plan that requires inspection of the equipment as frequently as practicable during safe-to-inspect times.

(k) Any parts of the closed vent system that are designated, as described in paragraph (1)(2) of this section, as difficult to inspect are exempt from the inspection requirements of paragraphs (f)(1)(i) and (f)(2) of this section if they comply with the requirements specified in paragraphs (k)(1) through (k)(3) of this section:
(1) The owner or operator determines that the equipment cannot be inspected without elevating the inspecting personnel more than 2 meters above a support surface; and
(2) The process unit within which the closed vent system is located becomes an affected facility through Secs. 60.14 or 60.15, or the owner or operator designates less than 3.0 percent of the total number of closed vent system equipment as difficult to inspect; and
(3) The owner or operator has a written plan that requires inspection of the equipment at least once every 5 years. A closed vent system is exempt from inspection if it is operated under a vacuum.

(l) The owner or operator shall record the information specified in paragraphs (l)(1) through (l)(5) of this section.
(1) Identification of all parts of the closed vent system that are designated as unsafe to inspect, an explanation of why the equipment is unsafe to inspect, and the plan for inspecting the equipment.
(2) Identification of all parts of the closed vent system that are designated as difficult to inspect, an explanation of why the equipment is difficult to inspect, and the plan for inspecting the equipment.
(3) For each inspection during which a leak is detected, a record of the information specified in Sec. 60.486(c).
(4) For each inspection conducted in accordance with Sec. 60.485(b) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected.
(5) For each visual inspection conducted in accordance with paragraph (f)(1)(ii) of this section during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected.

(m) Closed vent systems and control devices used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.

40 CFR 60.489-List of Chemicals Produced by Affected Facilities

The following chemicals are produced, as intermediates or final products, by process units covered under this subpart. The applicability date for process units producing one or more of these chemicals is January 5, 1981.

Acetal
Acetaldehyde
Acetaldol
Acetamide
Acetanilide
Acetic acid
Acetic anhydride
Acetone
Acetone cyanohydrin
Acetonitrile
Acetophenone
Acetyl chloride
Acetylene
Acrolein
Acrylamide
Acrylic acid
Acrylonitrile
Adipic acid
Adiponitrile
Alkyl naphthalenes
Allyl alcohol
Allyl chloride
Aminobenzoic acid
Aminoethylethanolamine
Aminophenol
Amyl acetates
Amyl alcohols
Amyl amine
Amyl chloride
Amyl mercaptans
Amyl phenol
Aniline
Aniline hydrochloride
Anisidine
Anisole
Anthranilic acid
Anthraquinone
Benzaldehyde
Bensamide
Benzene
Benzenedisulfonic acid
Benzenesulfonic acid
Benzil
Benzilic acid
Benzoic acid
Benzoin
Benzonitrile
Benzophenone
Benzotrichloride
Benzoly chloride
Benzyl alcohol
Benzylamine
Benzyl benzoate
Benzyl chloride
Benzyl dichloride
Biphenyl
Bisphenol A
Bromobenzene
Bromonaphthalene
Butadiene
1-butene
n-butyl acetate

List of Chemicals Produced by Affected Facilities, Continued . . .

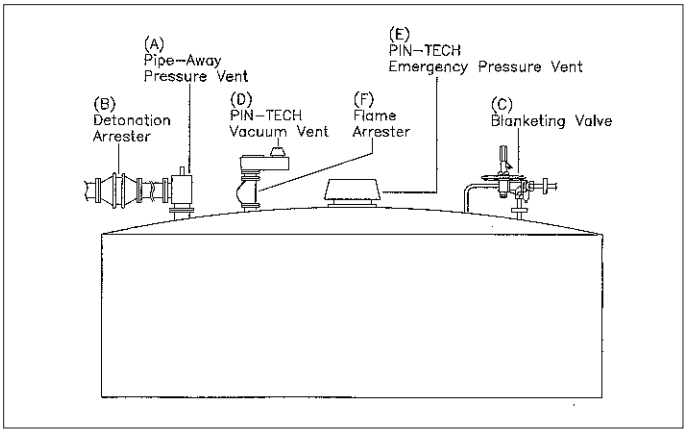
n-butyl acrylate
n-butyl alcohol
s-butyl alcohol
butyl alcohol
n-butylamine
s-butylamine
t-butylamine
p-tert-butyl benzoic acid
1, 2-butylene glycol
n-butyraldehyde
Butyric acid
Butyric anhydride
Butyronitrile
Caprolactam
Carbon disulfide
Carbon tetrabromide
Carbon tetrachloride
Cellulose acetate
Chloroacetic acid
m-chloroaniline
o-chloroaniline
p-chloroaniline
Chlorobenzaldehyde
Chlorobenzene
Chlorobenzoic acid
Chlorobenzotrichloride
Chlorobenzoyl chloride
Chlorodifluoromethane
Chlorodifluoroethane.s
Chloroform
Chloronapthalene
o-chloronitrobenzene
p-chloronitrobenzene
Chlorophenols
Chloroprene
Chlorosulfonic acid
m-chlorotoluene
o-chlorotoluene
p-chlorotoluene
Chlorotrifluoromethane
m-cresol
o-cresol
p-cresol
Mixed cresols
Cresylic acid
Crotonaldehyde
Crotonic acid
Cumene
Cumene hydroperoxide
Cyanoacetic acid
Cyanogen chloride
Cyanuric acid
Cyanuric chloride
Cyclohexane
Cyclohexanol
Cyclohexanone
Cyclohexene
Cyclohexylamine
Cyclooctadiene
Decanol
Diacetone alcohol
Diaminobenzoic acid
Dichloroaniline
m-dichlorobenzene
o-dichlorobenzene
p-dichlorobenzene
Dichlorodifluoromethane
Dichloroethyl ether
1,2-dichloroethane (EDC)
Dichlorohydrin
Dichloropropene
Dicyclohexylamine
Diethylamine
Diethylene glycol
Diethylene glycol diethyl ether
Diethylene glycol dimethyl ether
Diethylene glycol monobutyl ether
Diethylene glycol monobutyl ether acetate
Diethylene glycol monethyl ether
Diethylene glycol monoethyl ether acetate
Diethylene glycol monomethyl ether
Diethyl sulfate
Difluoroethane
Diisobutylene
Diisodecyl phthalate
Diisooctyl phthalate
Diketene
Dimethylamine
N,N-dimethylaniline
N,N-dimethyl ether
N,N-dimethylformamide
Dimethylhydrazine
Dimethyl sulfate
Dimethyl sulfide
Dimethyl sulfoxide
Dimethyl terephthalate
3,5-dinitrobenzoic acid
Dinitrophenol
Dinitrotoluene
Dioxane
Dioxilane
Diphenylamine
Diphenyl oxide
Diphenyl thiourea
Diproplyene glycol
Dodecene
Dodecylaniline
Dodecylphenol
Epichlorohydrin
Ethanol
Ethanolamines
Ethyl acetate
Ethyl acetoacetate
Ethyl acrylate
Ethylamine
Ethylbenzene
Ethyl bromide
Ethylcellulose
Ethyl chloride
Ethyl chloroacetate
Ethylcyanoacetate
Ethylene
Ethylene carbonate
Ethylene chlorohydrin
Ethylenediamine
Ethylene dibromide
Ethylene glycol
Ethylene glycol diacetate
Ethylene glycol dimethyl ether
Ethylene glycol monobutyl ether
Ethylene glycol monobutyl ether acetate
Ethylene glycol monoethyl ether
Ethylene glycol monoethyl ether acetate
Ethylene glycol monomethyl ether
Ethylene glycol monomethyl ether acetate
Ethylene glycol monophenyl ether
Ethylene glycol monopropyl ether
Ethylene oxide
Ethyl ether
2-ethylhexanol
Ethyl orthoformate
Ethyl oxalate
Ethyl sodium oxalacetate
Formaldehyde
Formamide
Formic acid
Fumaric acid
Furfural
Glycerol
Glycerol dichlorohydrin
Glycerol triether
Glycine
Glyoxal
Hexachlorobenzene
Hexachloroethane
Hexadecyl alcohol
Hexamethylenediamine
Hexamethylene glycol
Hexamethylenetetramine
Hydrogen cyanide
Hydroquinone
p-hydroxybenzoic acid
Isoamylene
Isobutanol
Isobutyl acetate
Isobutylene
Isobutyraldehyde
Isobutyric acid
Isodecanol
Isooctyl alcohol
Isopentane
Isophorone
Isophthalic acid
Isoprene
Isopropanol
Isopropyl acetate
Isopropylamine
Isopropyl chloride
Isopropylphenol
Ketene
Linear alkyl sulfonate
Linear alkylbenzene
Maleic acid
Maleic anhydride
Malic acid
Mesityl oxide
Metanilic acid
Methacrylic acid
Methallyl chloride
Methanol
Methyl acetate
Methyl acetoacetate
Methylamine
n-methylaniline
Methyl bromide
Methyl butynol
Methyl chloride
Methylcyclohexane
Methylcyclohexanone
Methylene chloride
Methylene dianiline
Methylene diphenyl
Diisocyanate
Methyl ethyl ketone
Methyl formate
Methyl isobutyl carbinol
Methyl isobutyl ketone.s
Methyl methacrylate
Methylpentynol
a-methylstyrene
Morpholine
a-naphthalene sulfonic acid
b-naphthalene sulfonic acid
a-naphthol
b-naphthol
Neopentanoic acid
o-nitroaniline
p-nitroaniline
o-nitroanisole
p-nitroanisole
Nitrobenzene
Nitrobenzoic acid
Nitroethane
Nitromethane
2-Nitrophenol.s
Nitropropane
Nitrotoluene
Nonene
Nonylphenol
Octylphenol
Paraldehyde
Pentaerythritol
n-pentane
1-pentene
Perchloroethylene
Perchloromethyl mercaptan
o-phenetidine
p-phenetidine
Phenol
Phenolsulfonic acids
Phenyl anthranilic acid
Phenylenediamine
Phosgene
Phthalic anhydride
Phthalimide
b-picoline
Piperazine

List of Chemicals Produced by Affected Facilities, Continued . . .

Polybutenes
Polyethylene glycol
Polypropylene glycol
Propional dehyde
Propionic acid
n-propyl alcohol
Propylamine
Propyl chloride
Propylene
Propylene chlorohydrin
Propylene dichloride
Propylene glycol.ss
Propylene oxide
Pyridine
Quinone
Resorcinol
Resorcylic acid
Salicylic acid
Sodium acetate
Sodium benzoate
Sodium carboxymethyl cellulose
Sodium chloroacetate
Sodium formate
Sodium phenate
Sorbic acid
Styrene
Succinic acid
Succinonitrile
Sulfanilic acid
Sulfolane
Tannic acid
Terephthalic acid
Tetrachloroethanes
Tetrachlorophthalic anhydride
Tetraethyl lead
Tetrahydronapthalene
Tetrahydrophthalic anhydride
Tetramethyl lead
Tetramethylenediamine
Tetramethylethylenediamine
Toluene
Toluene-2,4-diamine
Toluene-2,4-diisocyanate
Toluene diisocyanates (mixture)
Toluenesulfonamide
Toluenesulfonic acids
Toluenesulfonyl chloride
Toluidines
Trichlorobenzenes
1,1,1-trichloroethane
1,1,2-trichloroethane
Trichloroethylene
Trichlorofluoromethane
1,2,3-trichloropropane
1,1,2-trichloro-1,2,2-trifluoroethane
Triethylamine
Triethylene glycol
Triethylene glycol dimethly ether
Triisobutylene
Trimethylamine
Urea
Vinyl acetate
Vinyl chloride
Vinylidene chloride
Vinyl toluene
Xylenes (mixed)
o-xylene
p-xylene
Xylenol.s
Xylidine

The Protectoseal Zero-Leakage Tank System . . . Utilizing PIN-TECH Bubble-Tight < 500 ppm Technology

Since 1925 The Protectoseal Company has been the leading supplier of storage tank vents, flame and detonation arresters, tank blanketing valves and fittings used in a variety of liquid processing and storage applications. PIN-TECH Bubble-Tight <500 ppm Relief Vents, when used in conjunction with these other Protectoseal products, can provide a complete "zero leakage" tank system.



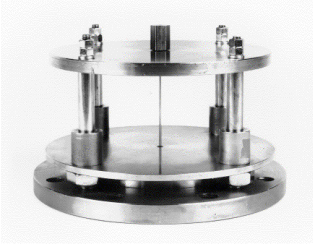
Normal pressure relief is provided through the Pipe-Away Pressure Relief Vent (A), with vapors directed to a destruction (flare) or recovery unit. The system is protected from possible ignition sources downstream by a Protectoseal Bi-Directional Detonation Arrester (B).

The Blanketing Valve's (C) function is to provide make-up gas to the tank's vapor space to relieve vacuum accumulations during normal operations. The PIN-TECH Emergency Pressure Relief Vent (E) remains sealed unless unusual conditions like fire involvement of the tank result in high pressures that must quickly be relieved. The bubble-tight tank system is completed with a PIN-TECH Vacuum Relief Vent (D) that will provide emergency vacuum relief if the blanketing gas supply is interrupted, and a Vent Line Flame Arrester (F) that guards against ignitions from an external source if the vacuum relief vent has opened.

Working together, these Protectoseal products provide a complete "zero leakage" tank system for containing volatile organic compounds or other hazardous materials.

PIN-TECH Pressure / Vacuum Relief Vents

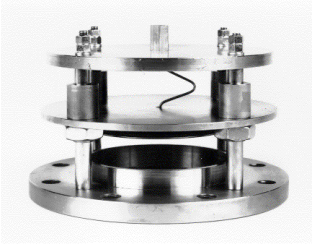
Protectoseal's PIN-TECH Relief Vents incorporate a unique buckling pin technology to hold the vent closed and maintain zero leakage up to the relief set point. The bucking pin is configured to sense the axial force caused by the tank pressure acting on the piston. The force required to buckle the pin is governed by Euler's Law and is a function of the pin's metallurgy, length and diameter.



Closed, Bubble-Tight

When the pressure in the tank reaches the vent set point, the pin buckles. This buckling action allows the piston to be quickly released and move to a full open relieving position.

After the pin has buckled and the vent has opened, a replacement pin can be easily installed (reestablishing the set point) without removing the vent from service.



Open, Full Flow

Each PIN-TECH vent is factory tested for leakagle and correct settings prior to shipment. Certification as bubble-tight as well as documentation of low parts per million leak rates can be provided.

Call TOLL-FREE: 1/800-323-2268, fax: 630/595-8059 or e-mail: info@protectoseal.com. Remember to visit our web site: www.protectoseal.com.

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