

**REGULATION 11  
HAZARDOUS POLLUTANTS  
RULE 6  
VINYL CHLORIDE**

**INDEX**

**11-6-100 GENERAL**

- 11-6-101 Description
- 11-6-110 Exemption, Research and Development

**11-6-200 DEFINITIONS**

- 11-6-201 Bulk Resin
- 11-6-202 Dispersion Resin
- 11-6-203 Emergency Valve Emission
- 11-6-204 Ethylene Dichloride Plant
- 11-6-205 Ethylene Dichloride Purification
- 11-6-206 Grade of Resin
- 11-6-207 Inprocess Wastewater
- 11-6-208 In Vinyl Chloride Service
- 11-6-209 Latex Resin
- 11-6-210 Polyvinyl Chloride Plants
- 11-6-211 Reactor
- 11-6-212 Reactor Opening Loss
- 11-6-213 Run
- 11-6-214 Slip Gauge
- 11-6-215 Standard Operating Procedure
- 11-6-216 Strippers
- 11-6-217 Type of Resin
- 11-6-218 Vinyl Chloride Plant
- 11-6-219 Vinyl Chloride Purification
- 11-6-220 Wastewater Treatment Process

**11-6-300 STANDARDS**

- 11-6-301 Ethylene Dichloride Oxychlorination Reactor
- 11-6-302 Ethylene Dichloride Purification
- 11-6-303 Vinyl Chloride Plants
- 11-6-304 Polyvinyl Chloride Reactors
- 11-6-305 Opening of a Polyvinyl Chloride Vessel
- 11-6-306 Polyvinyl Chloride Mixing, Weighing, and Holding
- 11-6-307 Polyvinyl Chloride Monomer Recovery System
- 11-6-308 Polyvinyl Chloride Stripper
- 11-6-309 Miscellaneous Sources Following a Polyvinyl Chloride Stripper
- 11-6-310 Relief Valve Discharge
- 11-6-311 Loading and Unloading
- 11-6-312 Slip Gauges
- 11-6-313 Rotating Pumps and Compressors
- 11-6-314 Reciprocating Pumps and Compressors
- 11-6-315 Agitators
- 11-6-316 Leakage from Relief Valves
- 11-6-317 Manual Venting of Gases

- 11-6-318 Opening of Equipment
- 11-6-319 Samples
- 11-6-320 Inprocess Wastewater

**11-400 ADMINISTRATIVE REQUIREMENTS**

- 11-6-401 Emergency Emissions
- 11-6-402 Semiannual Report
- 11-6-403 Testing
- 11-6-404 Prior Notification
- 11-6-405 Initial Start-Up

**11-6-500 MONITORING AND RECORDS**

- 11-6-501 Monitoring
- 11-6-502 Records and Maintenance

**11-6-600 MANUAL OF PROCEDURES**

- 11-6-601 Emission Monitoring, Source Testing, Analytical Procedures and Leak Detection

**REGULATION 11**  
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**RULE 6**  
**VINYL CHLORIDE**

(Adopted April 21, 1982)

**11-6-100 GENERAL**

**11-6-101 Description:** The purpose of this Rule is to control the emissions of vinyl chloride into the atmosphere from plants which produce the following: ethylene dichloride by reaction of oxygen and hydrogen chloride with ethylene; vinyl chloride by any process; one or more polymers containing any fraction of polymerized vinyl chloride.

**11-6-110 Exemption; Research and Development:** This rule shall not apply to equipment used in research and development provided the reactor used to polymerize the vinyl chloride has a capacity of 0.19 m<sup>3</sup> (50 gal.) or less. Only the following sections of this rule apply to equipment used in research and development if the reaction used to polymerize the vinyl chloride processed in the equipment has a capacity of greater than 0.19 m<sup>3</sup> (50 gal.) and no more than 4.07 m<sup>3</sup> (1100 gal.): 11-6-305, 306, 307, 308, 403 and 501.1.

**11-6-200 DEFINITIONS**

**11-6-201 Bulk Resin:** Resin which is produced by a polymerization process in which no water is used.

**11-6-202 Dispersion Resin:** A resin manufactured in such a way as to form fluid dispersions when dispersed in a plasticizer or plasticizer/diluent mixtures.

**11-6-203 Emergency Valve Emission:** A discharge which could not have been avoided by taking preventive measures.

**11-6-204 Ethylene Dichloride Plant:** Any plant which produces ethylene dichloride by reaction of oxygen and hydrogen chloride with ethylene.

**11-6-205 Ethylene Dichloride Purification:** Any part of the process of ethylene dichloride production which follows ethylene dichloride formation and in which finished ethylene dichloride is produced.

**11-6-206 Grade of Resin:** The subdivision of resin classification which describes it as a unique resin, i.e., the most exact description of a resin with no further subdivision.

**11-6-207 Inprocess Wastewater:** Any water which, during manufacturing or processing, comes into direct contact with vinyl chloride or polyvinyl chloride or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product containing vinyl chloride or polyvinyl chloride but which has not been discharged to a wastewater treatment process or discharged untreated as wastewater.

**11-6-208 In Vinyl Chloride Service:** Equipment which contains or contacts either a liquid that is at least 10 percent by weight vinyl chloride or a gas that is at least 10 percent by volume vinyl chloride.

**11-6-209 Latex Resin:** Resin which is produced by a polymerization process which initiates from free radical catalyst sites and is sold undried.

**11-6-210 Polyvinyl Chloride Plants:** Any plant where vinyl chloride alone or in combination with other materials is polymerized.

**11-6-211 Reactor:** Any vessel in which vinyl chloride is partially or totally polymerized into polyvinyl chloride.

**11-6-212 Reactor Opening Loss:** The emissions of vinyl chloride occurring when a reactor is vented to the atmosphere for any purpose other than an emergency emission as defined in Section 11-6-203.

**11-6-213 Run:** The net period of time during which an emission sample is collected.

- 11-6-214 Slip Gauge:** Gauge which has a probe that moves through the gas/liquid interface in a storage or transfer vessel and indicates the level of vinyl chloride in the vessel by the physical state of the material the gauge discharges.
- 11-6-215 Standard Operating Procedure:** A formal written procedure officially adopted by the plant owner or operator and available on a routine basis to those persons responsible for carrying out the procedure.
- 11-6-216 Strippers:** Any vessel in which residual vinyl chloride is removed from polyvinyl chloride resin, except bulk resin, in the slurry form by the use of heat and/or vacuum. In the case of bulk resin, stripper includes any vessel which is used to remove residual vinyl chloride from polyvinyl chloride resin immediately following the polymerization step in the plant process flow.
- 11-6-217 Type of Resin:** The broad classification of resin referring to the basic manufacturing process for producing that resin, including, but not limited to, the suspension, dispersion, latex, bulk and solution process.
- 11-6-218 Vinyl Chloride Plant:** Any plant which produces vinyl chloride by any process.
- 11-6-219 Vinyl Chloride Purification:** Any part of the process of vinyl chloride production which follows vinyl chloride formation and in which finished vinyl chloride is produced.
- 11-6-220 Wastewater Treatment Process:** Any process which modifies characteristics such as BOD, COD, TSS, and pH, usually for the purpose of meeting effluent guidelines and standards; it does not include any process the purpose of which is to remove vinyl chloride from water to meet requirements of this rule.
- 11-6-300 STANDARDS**
- 11-6-301 Ethylene Dichloride Oxychlorination Reactor:** A person shall not discharge into the atmosphere from an oxychlorination reactor a gas stream with a concentration of vinyl chloride in excess of 0.20 g/kg (0.0002 lb/lb) of 100 percent ethylene dichloride produced.
- 11-6-302 Ethylene Dichloride Purification:** A person shall not discharge into the atmosphere from any equipment at an ethylene dichloride purification plant a gas stream with a concentration of vinyl chloride in excess of 10 ppm. This requirement does not apply to equipment that has been opened, is out of operation and meets the requirements of Section 11-6-318.
- 11-6-303 Vinyl Chloride Plants:** A person shall not discharge into the atmosphere from any equipment used in vinyl chloride formation and/or purification a gas stream with a concentration of vinyl chloride in excess of 10 ppm. This requirement does not apply to equipment that has been opened, is out of operation and meets the requirements of Section 11-6-318.
- 11-6-304 Polyvinyl Chloride Reactors:** A person shall not discharge into the atmosphere from any reactor at a polyvinyl chloride plant a gas stream with a concentration of vinyl chloride in excess of 10 ppm. This requirement does not apply to a reactor that has been opened, is out of operation and meets the requirements of Section 11-6-318.
- 11-6-305 Opening of a Polyvinyl Chloride Vessel:** The emissions of vinyl chloride from a reactor or stripper vessel when opened shall not be in excess of 0.02 g/kg (0.00002 lb/lb) of polyvinyl chloride product (on a dry basis). In the bulk process, the total product shall include the gross product of both prepolymerization and postpolymerization.
- 11-6-306 Polyvinyl Chloride Mixing, Weighting, and Holding:** A person shall not discharge into the atmosphere from each mixing, weighing or holding container in vinyl chloride service which precedes the stripper (or reactor if the plant has no stripper) a gas stream with a concentration of vinyl chloride in excess of 10 ppm.
- 11-6-307 Polyvinyl Chloride Monomer Recovery System:** A person shall not discharge into the atmosphere from a monomer recovery system a gas stream with a concentration of vinyl chloride in excess of 10 ppm.
- 11-6-308 Polyvinyl Chloride Stripper:** A person shall not discharge into the atmosphere from a polyvinyl chloride stripper a gas stream with a concentration of vinyl chloride in excess of 10 ppm.

**11-6-309 Miscellaneous Sources Following a Polyvinyl Chloride Stripper:** A person who operates a centrifuge, concentrator, blend tank, filter, dryer, conveyor air discharge, bagger, storage container, inprocess wastewater system or any other equipment following a stripper or a reactor where no stripper is used, in a polyvinyl chloride plant shall meet the requirements of either subsections 309.1 or 309.2 below:

309.1 For polyvinyl chloride plants using stripping technology to control vinyl chloride emissions, the weighted average residual vinyl chloride concentration in all grades of polyvinyl chloride resin processed through the stripping operation on each calendar day, measured immediately after the stripping operation is completed, shall not exceed the following limits:

Polyvinyl chloride dispersion resins excluding latex resins	2000 ppm
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All other polyvinyl chloride resins, including latex resins, averaged separately for each type of resin	400 ppm
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309.2 For polyvinyl chloride plants controlling vinyl chloride emissions with technology other than stripping, or in addition to stripping, the emissions of vinyl chloride to the atmosphere shall not exceed the following limits:

Dispersion polyvinyl chloride resins excluding latex resins	2 g/kg (0.002 lb/lb) of dry solid product from the stripper (or reactor if no stripper is used)
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All other polyvinyl chloride resins, including latex resins	0.4 g/kg (0.0004 lb/lb) of dry solid product from the stripper (or reactor if no stripper is used)
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**11-6-310 Relief Valve Discharge:** Except for an emergency relief discharge, there will be no emissions to the atmosphere from any relief valve on any equipment in vinyl chloride service.

**11-6-311 Loading and Unloading:** After each loading or unloading operation and before the loading and unloading lines are opened to the atmosphere, the quality of vinyl chloride in all parts of the lines shall be reduced to 0.0038 m<sup>3</sup> (0.13 ft<sup>3</sup>) or less. Any vinyl chloride removed from the loading or unloading lines shall be ducted through a control device from which the concentration of vinyl chloride in the exhaust gases does not exceed 10 ppm.

**11-6-312 Slip Gauges:** During the loading or unloading of vinyl chloride, emissions from slip gauges in vinyl chloride service shall be ducted through a control device from which vinyl chloride emissions shall not exceed 10 ppm.

**11-6-313 Rotating Pumps and Compressors:** All rotating pumps and compressors in vinyl chloride service shall be sealless, or equipped with double mechanical seals. If double mechanical seals are utilized, the pressure between the two seals shall be maintained so that any leak that occurs is onto the pump; or any leak between the two seals shall be ducted through a control device from which the exhaust gases do not contain vinyl chloride concentrations in excess of 10 ppm.

**11-6-314 Reciprocating Pumps and Compressors:** All reciprocating pumps and compressors in vinyl chloride service shall be equipped with double outboard seals and the pressure maintained between the two seals so that any leak that occurs is into the pump; or any leak between the two seals shall be ducted through a control device from which the exhaust gases do not contain vinyl chloride concentrations in excess of 10 ppm.

**11-6-315 Agitators:** All agitators in vinyl chloride service shall be equipped with double mechanical seals and the pressure between the two seals shall be maintained so that any leak that occurs between the two seals shall be ducted through a control device from which the exhaust gases do not contain vinyl chloride concentrations in excess of 10 ppm.

**11-6-316 Leakage from Relief Valves:** Each relief valve in vinyl chloride service shall be equipped with a rupture disk installed between the relief valve and the equipment; or the relief valve discharge shall be connected to a process line or a recovery system.

- 11-6-317 Manual Venting of Gases:** Except in the case of emergency manual vent valve discharge, all gases which are manually vented from equipment in vinyl chloride service shall be ducted through a control device from which the exhaust gases do not contain vinyl chloride concentrations in excess of 10 ppm.
- 11-6-318 Opening of Equipment:** Before opening any equipment in vinyl chloride service, except as set forth in 11-6-305, the quantity of vinyl chloride in the equipment shall not contain more than 2.0 percent by volume vinyl chloride or 0.0950 m<sup>3</sup> (25 gal) of vinyl chloride, whichever is larger, at standard temperature and pressure. Any vinyl chloride remover pursuant to this section shall be ducted through a control device from which the concentrations of vinyl chloride in the exhaust gases does not exceed 10 ppm.
- 11-6-319 Samples:** Unused portions of samples containing 10 percent or more by weight vinyl chloride shall be returned to the process. Sample containers in vinyl chloride service shall be purged into a closed process system.
- 11-6-320 Inprocess Wastewater:** The concentration of vinyl chloride in each inprocess wastewater stream shall not exceed 10 ppm before being mixed with any other inprocess wastewater stream which contains less than 10 ppm vinyl chloride, before being exposed to the air, discharged to a wastewater treatment facility or discharged untreated as wastewater. This section does not apply to water used to wash out equipment after it has been opened to the atmosphere. Any vinyl chloride removed from the inprocess wastewater shall be ducted through a control device the exhaust gases from which do not contain concentrations of vinyl chloride in excess of 10 ppm.

#### **11-6-400 ADMINISTRATIVE REQUIREMENTS**

- 11-6-401 Emergency Emissions:** Within 10 days of any emissions from a manual vent valve, the owner or operator of the source from which the emissions occurred shall submit to the APCO a report in writing containing information on the source, nature and cause of the emission: the date and time of the emission: the approximate amount of vinyl chloride emitted and the method used to determine the amount; the action taken to prevent the emission, and measures which will be adopted to prevent future emissions.
- 11-6-402 Semiannual Report:** The owner or operator shall submit to the APCO within 180 days of the initial startup date, and semiannually thereafter on September 15 and March 15 of each year a report which includes the following information.
- 402.1 A record of any emissions which averaged over any hour period commencing on the hour which exceed the limits set forth in Sections 301,302,303, 304,305,306, 307,308,311,312,315,317,318, and 320 of this rule.
  - 402.2 A record of the vinyl chloride content in the polyvinyl chloride resin.
  - 402.3 A record of the emissions of each reactor when opened.
- 11-6-403 Testing:** Unless a waiver of emission testing has been obtained from the APCO, a person shall test emissions from the plant within 90 days of start-up.
- 11-6-404 Prior Notification:** The APCO shall be notified at least 30 days prior to an emission test, in order that the APCO have the option to conduct or observe the test.
- 11-6-405 Initial Start-Up:** An owner or operator of any source to which this rule applies shall submit within 90 days of the initial startup date a written report notifying the APCO that Sections 11-6-311, 312, 318 and 320 are being implemented. The report shall contain the following information:
- 405.1 A list of equipment installed for compliance.
  - 405.2 A description of the equipment.
  - 405.3 A description of the method used to measure and/or calculate vinyl chloride emissions from the equipment.
  - 405.4 A statement that the procedures are being used for each piece of equipment.

#### **11-6-500 MONITORING AND RECORDS**

- 11-6-501 Monitoring:** A person subject to the requirements of Sections 11-6-302, 303, 305, 311, 312, 317, 318 and 320 shall install and maintain a continuous vinyl chloride emission monitoring system.

- 11-6-502 Records and Maintenance:** All records obtained as a result of the requirements of this rule shall be maintained for a period of two years and made available for inspection by the APCO upon his request.
- 11-6-600 MANUAL OF PROCEDURES**
- 11-6-601 Emission Monitoring, Source Testing, Analytical Procedures and Leak Detection:** Emission monitoring source testing, analytical methods and leak detection shall be accomplished as set forth in the Manual of Procedures.