

**CALIFORNIA AIR RESOURCES BOARD
FINAL REGULATION ORDER**

**§93109 - AIRBORNE TOXIC CONTROL MEASURE FOR
EMISSIONS OF PERCHLOROETHYLENE FROM
DRY-CLEANING OPERATIONS**

APPROVED BY THE OFFICE OF ADMINISTRATIVE LAW ON 5/4/94
OPERATIVE DATE 6/4/94

CONTENTS

<u>Subsection</u>	<u>Topic</u>	<u>Starting Page</u>
(a)	Definitions	1
(b)	Applicability	5
(c)	Initial Notification	5
(d)	Recordkeeping	5
(e)	Annual Reporting	6
(f)	Good Operating Practices	7
(g)	Equipment	10
(h)	Equipment Testing	14
(i)	Water-Repelling and Dip Tank Operations	16
(j)	Compliance	17
TABLE 1	Equipment Requirements and Summary of Compliance Times for Existing and New Facilities	18

ARB Adopted: October 14, 1993

Visit ARB Website at <http://www.arb.ca.gov/toxics/atcm/atcm.htm> for recent updates.

ARB Dry Cleaning Program: <http://www.arb.ca.gov/toxics/dryclean/dryclean.htm>

FINAL REGULATION ORDER

§93109: Perchloroethylene Airborne Toxic Control Measure--Dry Cleaning Operations.

APPROVED BY THE OFFICE OF ADMINISTRATIVE LAW ON MAY 4, 1994

- (a) **Definitions.** For the purpose of this section, the following definitions shall apply:
- (1) “Adsorptive cartridge filter” means a replaceable cartridge filter that contains diatomaceous earth or activated clay as the filter medium.
 - (2) “Cartridge filter” means a replaceable cartridge filter that contains one of the following as the filter medium: paper, activated carbon, or paper and activated carbon. A cartridge filter contains no diatomaceous earth or activated clay. Cartridge filters include, but are not limited to: standard filters, split filters, “jumbo” filters, and all carbon polishing filters.
 - (3) “Closed-loop machine” means dry cleaning equipment in which washing, extraction, and drying are all performed in the same single unit (also known as dry-to-dry) and which recirculates perchloroethylene-laden vapor through a primary control system with no exhaust to the atmosphere during the drying cycle. A closed-loop machine may allow for venting to the ambient air through a fugitive control system after the drying cycle is complete and only while the machine door is open.
 - (4) “Co-located with a residence” means sharing a common wall, floor, or ceiling with a residence. For the purposes of this definition, “residence” means any dwelling or housing which is owned, rented, or occupied by the same person for a period of 180 days or more, excluding short-term housing such as a motel or hotel room rented and occupied by the same person for a period of less than 180 days.
 - (5) “Converted machine” means an existing vented machine that has been modified to be a closed-loop machine by eliminating the aeration step, installing a primary control system, and providing for recirculation of the perchloroethylene-laden vapor with no exhaust to the atmosphere or workroom during the drying cycle. A converted machine may allow for venting to the ambient air through a fugitive control system after the drying cycle is complete and only while the machine door is open.
 - (6) “Cool-down” means the portion of the drying cycle that begins when the heating mechanism deactivates and the refrigerated condenser continues to reduce the temperature of the air recirculating through the drum to reduce the concentration of perchloroethylene in the drum.
 - (7) “Date of compliance” means the time from the effective date of this control measure in the district until a facility must be in compliance with the specific requirements of this control measure.
 - (8) “Desorption” means regeneration of an activated carbon bed, or any other type of vapor adsorber by removal of the adsorbed solvent using hot air, steam, or other means.

- (9) “Dip tank operations” means the immersion of materials in a solution that contains perchloroethylene, for purposes other than dry cleaning, in a tank or container that is separate from the dry cleaning, in a tank or container that is separate from the dry cleaning equipment.
- (10) “District” means the local air pollution control district or air quality management district.
- (11) “Drum” means the rotating cylinder or wheel of the dry cleaning machine that holds the materials being cleaned.
- (12) “Dry cleaning equipment” means any machine, device, or apparatus used to dry clean materials with perchloroethylene or to remove residual perchloroethylene from previously cleaned materials. Dry cleaning equipment may include, but is not limited to, a transfer machine, a vented machine, a converted machine, a closed-loop machine, a reclaimer, or a drying cabinet.
- (13) “Dry cleaning system” means all of the following equipment, devices, or apparatus associated with the perchloroethylene dry cleaning process: dry cleaning equipment; filter or purification systems; waste holding, treatment, or disposal systems; perchloroethylene supply systems; dip tanks; pumps; gaskets; piping, ducting, fittings, valves, or flanges that convey perchloroethylene-contaminated air; and control systems.
- (14) “Drying cabinet” means a housing in which materials previously cleaned with perchloroethylene are placed to dry and which is used only to dry materials that would otherwise be damaged by the heat and tumbling action of the drying cycle.
- (15) “Drying cycle” means the process used to actively remove the perchloroethylene remaining in the materials after washing and extraction. For closed-loop machines, the heated portion of the cycle is followed by cool-down and may be extended beyond cool-down by the activation of a control system. The drying cycle begins when heating coils are activated and ends when the machine ceases rotation of the drum.
- (16) “Environmental training program” means an initial course or a refresher course of the environmental training program for perchloroethylene dry cleaning operations that has been authorized by the Air Resources Board according to the requirements of 17 CCR, Section 93110.
- (17) “Equivalent closed-loop vapor recovery system” means a device or combination of devices that achieves, in practice, a perchloroethylene recovery performance equal to or exceeding that of refrigerated condensers.
- (18) “Existing facility” means any facility that operated dry cleaning equipment prior to the effective date of this control measure in the district. Facility relocations, within the same district, shall be considered existing facilities for the purposes of this control measure.
- (19) “Facility” means any entity or entities which: own or operate perchloroethylene dry cleaning equipment, are owned or operated by the same person or persons, and are located on the same parcel or contiguous parcels.

- (20) “Facility mileage” means the efficiency of perchloroethylene use at a facility, expressed as the pounds of materials cleaned per gallon of perchloroethylene used, and calculated for all dry cleaning machines at the facility over a specified time period.
- (21) “Fugitive control system” means a device or apparatus that collects fugitive perchloroethylene vapors from the machine door, button and lint traps, still, or other intentional openings of the dry cleaning system and routes those vapors to a device that reduces the mass of perchloroethylene prior to exhaust of the vapor to the atmosphere.
- (22) “Full-time employee” means any person who is employed at the dry cleaning facility and averages at least 30 hours per week in any 90-day period.
- (23) “Gallons of perchloroethylene used” means the volume of perchloroethylene, in gallons, introduced into the dry cleaning equipment, and not recovered at the facility for reuse on-site in the dry cleaning equipment, over a specified time period.
- (24) “Halogenated-hydrocarbon detector” means a portable device capable of detecting vapor concentrations of perchloroethylene of 25 ppmv or less and indicating an increasing concentration by emitting an audible signal or visual indicator that varies as the concentration changes.
- (25) “Liquid leak” means a leak of liquid containing perchloroethylene of more than 1 drop every 3 minutes.
- (26) “Materials” means wearing apparel, draperies, linens, fabrics, textiles, rugs, leather, and other goods that are dry cleaned.
- (27) “Muck cooker” means a device for heating perchloroethylene-laden waste material to volatilize and recover perchloroethylene.
- (28) “New facility” means a facility that did not operate any dry cleaning equipment prior to the effective date of this control measure in the district. Facility relocations, within the same district, shall not be considered new facilities for the purposes of this control measure.
- (29) “Perceptible vapor leak” means an emission of perchloroethylene vapor from unintended openings in the dry cleaning system, as indicated by the odor of perchloroethylene or the detection of gas flow by passing the fingers over the surface of the system. This definition applies for an interim period of 18 months only, beginning on the effective date of this control measure in the district.
- (30) “Perchloroethylene (Perc)” means the substance with the chemical formula ‘C₂Cl₄’, also known by the name ‘tetrachloroethylene’, which has been identified by the Air Resources Board and listed as a toxic air contaminant in 17 CCR, Section 93000.
- (31) “Perchloroethylene dry cleaning” or “dry cleaning” means the process used to remove soil, greases, paints, and other unwanted substances from materials with perchloroethylene.

- (32) “Pounds of materials cleaned per load” means the total dry weight, in pounds, of the materials in each load dry cleaned at the facility, as determined by weighing each load on a scale prior to dry cleaning and recording the value.
- (33) “Primary control system” means a refrigerated condenser, or an equivalent closed-loop vapor recovery system approved by the district.
- (34) “Reclaimer” means a machine, device, or apparatus used only to remove residual perchloroethylene from materials that have been previously cleaned in a separate piece of dry cleaning equipment.
- (35) “Reasonably available”, as it applies to an initial course for the environmental training program, means that the course is offered within 200 miles of the district boundaries and that all such courses have a capacity, in the aggregate, that is adequate to accommodate at least one person from each facility in the district required to certify a trained operator at that time.
- (36) “Refrigerated condenser” means a closed-loop vapor recovery system into which perchloroethylene vapors are introduced and trapped by cooling below the dew point of the perchloroethylene.
- (37) “Secondary control system” means a device or apparatus that reduces the concentration of perchloroethylene in the recirculating air at the end of the drying cycle beyond the level achievable with a refrigerated condenser alone. An “integral” secondary control system is designed and offered as an integral part of a production package with a single make and model of dry cleaning machine and primary control system. An “add-on” secondary control system is designed or offered as a separate retrofit system for use on multiple machine makes and models.
- (38) “Self-service dry cleaning machine” means a perchloroethylene dry cleaning machine that is loaded, activated, or unloaded by the customer.
- (39) “Separator” means any device used to recover perchloroethylene from a water-perchloroethylene mixture.
- (40) “Still” means a device used to volatilize and recover perchloroethylene from contaminated solvent removed from the cleaned materials.
- (41) “Trained operator” means the owner, the operator, or an employee of the facility, who holds a record of completion for the initial course of an environmental training program and maintains her/his status by successfully completing the refresher courses as required.
- (42) “Transfer machine” means a combination of perchloroethylene dry cleaning equipment in which washing and extraction are performed in one unit and drying is performed in a separate unit.

- (43) “Vapor adsorber” means a bed of activated carbon or other adsorbent into which perchloroethylene vapors are introduced and trapped for subsequent desorption.
- (44) “Vapor leak” means an emission of perchloroethylene vapor from unintended openings in the dry cleaning system, as indicated by a rapid audible signal or visual signal from a halogenated-hydrocarbon detector or a concentration of perchloroethylene exceeding 50 ppmv as methane as indicated by a portable analyzer. This definition applies beginning 18 months after the effective date of this control measure in the district.
- (45) “Vented machine” means dry cleaning equipment in which washing, extraction, and drying are all performed in the same single unit and in which fresh air is introduced into the drum in the last step of the drying cycle and exhausted to the atmosphere, either directly or through a control device.
- (46) “Waste water evaporator” means a device that vaporizes perchloroethylene-contaminated waste water through the addition of thermal or chemical energy, or through physical action.
- (47) “Water-repelling operations” means the treatment of materials with a water-repellent solution that contains perchloroethylene.
- (b) Applicability.** Any person who owns or operates perchloroethylene dry cleaning equipment shall comply with Section 93109.
- (c) Initial Notification.** The owner/operator shall provide the district with all of the following information, in writing:
- (1) By the applicable date shown in column 2 of Table 1.
 - (A) The name(s) of the owner and operator of the facility.
 - (B) The facility name and location.
 - (C) Whether or not the facility is co-located with a residence.
 - (D) The number, types, and capacities of all dry cleaning equipment.
 - (E) Any control systems for each dry cleaning machine.
 - (F) For existing facilities only, the gallons of perchloroethylene purchased by the facility during the previous calendar year.
 - (2) A district may exempt a source from item (1) of this subsection if the district maintains current equivalent information on the facility.
- (d) Recordkeeping.** The owner/operator shall maintain records for the specified time period, beginning on the applicable date shown in column 3 of Table 1. The records, or copies thereof, shall be accessible at the facility at all times.

- (1) All of the following records shall be retained for at least 2 years or until the next district inspection of the facility, whichever period is longer.
 - (A) For each dry cleaning machine, a log showing the date and the pounds of materials cleaned per load.
 - (B) Purchase and delivery receipts for perchloroethylene.
 1. For only those facilities with solvent tanks that are not directly filled by the perchloroethylene supplier upon delivery, the date(s) and gallons of perchloroethylene added to the solvent tank of each dry cleaning machine.
 - (C) The completed leak inspection checklists required by subsection (f)(2) and the operation and maintenance checklists required by subsection (f)(1)(A).
 - (D) For liquid leaks, perceptible vapor leaks, or vapor leaks that were repaired at the time of detection, a record of the leaking component(s) of the dry cleaning system awaiting repair and the action(s) taken to complete the repair. The record shall include copies of purchase orders or other written records showing when the repair parts were ordered and/or service was requested.
- (2) For dry cleaning equipment installed after the effective date of this control measure in the district, the manufacturer's operating manual for all components of the dry cleaning system shall be retained for the life of the equipment.
- (3) The original record of completion for each trained operator shall be retained during the employment of that person. A copy of the record of completion shall be retained for an additional period of two years beyond the separation of that person from employment at the facility.
- (e) **Annual Reporting.** The owner/operator shall maintain an annual report. At the district's discretion, the facility owner or operator shall furnish this annual report to the district by the date specified by the district. The annual report shall include all of the following:
 - (1) A copy of the record of completion for each trained operator.
 - (2) The total of the pounds of materials cleaned per load and the gallons of pechloroethylene used for all solvent additions in the reporting period.
 - (3) The average facility mileage, determined from all solvent additions in the reporting period, as follows:

The Total of the Pounds of Materials Cleaned Per Load
The Total of the Gallons of Perchloroethylene Used

(f) **Good Operating Practices.** The owner/operator shall not operate dry cleaning equipment after the applicable dates shown in column 5 and column 6 of Table 1, unless all of the following requirements are met:

(1) Operation and maintenance requirements. The trained operator, or his/her designee, shall operate and maintain all components of the dry cleaning system in accordance with the requirements of this section and the conditions specified in the facility's operating permit beginning on the applicable date specified in column 5 of Table 1. For operations not specifically addressed, the components shall be operated and maintained in accordance with the manufacturer's recommendations.

(A) The district shall provide an operation and maintenance checklist to the facility. Each operation and maintenance function and the date performed shall be recorded on the checklist. The operation and maintenance checklist provided by the district shall include, at a minimum, the following requirements:

1. Refrigerated condensers shall be operated to ensure that exhaust gases are recirculated until the air-vapor stream temperature on the outlet side of the refrigerated condenser, downstream of any bypass, is less than or equal to 45°F (7.2°C).
2. Primary control systems, other than refrigerated condensers, shall be operated to ensure that exhaust gases are recirculated until the perchloroethylene concentration in the drum is less than or equal to 8,600 ppmv at the end of the drying cycle, before the machine door is opened and any fugitive control system activates.
3. Vapors adsorbers used as a primary control system or secondary control system shall be operated to ensure that exhaust gases are recirculated at the temperature specified by the district, based on the manufacturer's recommendations for optimum adsorption. These vapor adsorbers shall be desorbed according to the conditions specified by the district in the facility's operating permit, including a requirement that no perchloroethylene vapors shall be routed to the atmosphere during routine operation or desorption.
4. During the interim period between compliance with this subsection and compliance with the requirements of subsection (g), an existing facility with a transfer machine or a vented machine shall operate any existing carbon adsorber, which functions during the drying cycle, to meet the following requirements:
 - i. Desorption shall be performed periodically, at the frequency specified by the district. The frequency, at a minimum, shall be each time all dry cleaning equipment exhausted to the device has cleaned a total of three pounds of materials for each pound of activated carbon. Desorption shall be performed with the minimum steam pressure and air flow capacity specified by the district.

- ii. Once desorption is complete, the carbon bed shall be fully dried according to the manufacturer's instructions.
 - iii. No vented perchloroethylene vapors shall bypass the carbon adsorber to the atmosphere.
 - 5. Cartridge filters and adsorptive cartridge filters shall be handled using one of the following methods.
 - i. Drained in the filter housing, before disposal, for no less than: 24 hours for cartridge filters and 48 hours for adsorptive cartridge filters. If the filters are then transferred to a separate device to further reduce the volume of perchloroethylene, this treatment shall be done in a system that routes any vapor to a primary control system, with no exhaust to the atmosphere or workroom.
 - ii. Dried, stripped, sparged, or otherwise treated, within the sealed filter housing, to reduce the volume of perchloroethylene contained in the filter.
 - 6. A still, and any muck cooker, shall not exceed 75 percent of its capacity, or an alternative level recommended by the manufacturer. A still, and any muck cooker, shall cool to 100°F (38°C) or less before emptying or cleaning.
 - 7. Button and lint traps shall be cleaned each working day and the lint placed in a tightly sealed container.
 - 8. All parts of the dry cleaning system where perchloroethylene may be exposed to the atmosphere or workroom shall be kept closed at all times except when access is required for proper operation and maintenance.
 - 9. Waste water evaporators shall be operated to ensure that no liquid perchloroethylene or visible emulsion is allowed to vaporize.
- (2) Leak check and repair requirements. The trained operator, or her/his designee, shall inspect the dry cleaning system for liquid leaks and perceptible vapor leaks beginning on the applicable date shown in column 5 of Table 1. The trained operator, or her/his designee, shall inspect the dry cleaning system for vapor leaks instead of perceptible vapor leaks beginning 18 months after the effective date of this control measure in the district. The district shall provide a leak inspection checklist to the facility. The trained operator, or her/his designee, shall record the status of each component on the checklist.
- (A) The dry cleaning system shall be inspected at least once per week for liquid leaks and
- 1. For perceptible vapor leaks, beginning on the applicable date shown in column 5 of Table 1 until 18 months after the effective date of this control measure in the district.

2. For vapor leaks, beginning 18 months after the effective date of this control measure in the district, using one of the following techniques:
 - i. A halogenated-hydrocarbon detector.
 - ii. A portable gas analyzer or an alternative method approved by the district.
- (B) Any liquid leak, perceptible vapor leak, or vapor leak that has been detected by the operator shall be noted on the checklist and repaired according to the requirements of this subsection. If the leak is not repaired at the time of detection, the leaking component shall be physically marked or tagged in a manner that is readily observable by a district inspector.
- (C) Any liquid leak, perceptible vapor leak, or vapor leak detected by the district, which has not been so noted on the checklist and marked on the leaking component of the dry cleaning system, shall constitute a violation of this section. For enforcement purposes, the district shall:
 1. Identify the presence of a perceptible vapor leak based on the odor of perchloroethylene or the detection of gas flow by passing the fingers over the surface of the system.
 2. Identify the presence of a vapor leak by determining the concentration of perchloroethylene with a portable analyzer:
 - i. According to ARB Test Method 21 (17 CCR, Section 94124, March 28, 1986).
 - ii. Measured 1 cm. away from the dry cleaning system.
- (D) Any liquid leak or vapor leak shall be repaired within 24 hours of detection.
 1. If repair parts are not available at the facility, the parts shall be ordered within two working days of detecting such a leak. Such repair parts shall be installed within five working days after receipt. A facility with a leak that has not been repaired by the end of the 15th working day after detection shall not operate the dry cleaning equipment, until the leak is repaired, without a leak-repair extension from the district.
 2. A district may grant a leak-repair extension to a facility, for a single period of 30 days or less, if the district makes these findings:
 - i. The delay in repairing the leak could not have been avoided by action on the part of the facility.
 - ii. The facility used reasonable preventive measures and acted promptly to initiate the repair.

- iii. The leak would not significantly increase Perc exposure near the facility.
 - iv. The facility is in compliance with all other requirements of this section and has a history of compliance.
- (3) Environmental training requirements. The facility shall have one or more trained operators beginning on the applicable date shown in column 6 of Table 1.
 - (A) A trained operator shall be the owner, the operator, or another employee of the facility, who successfully completes the initial course of an environmental training program to become a trained operator. Evidence of successful completion of the initial course shall be the original record of completion issued pursuant to 17 CCR, Section 93110. The trained operator shall be a full-time employee of the facility. Except for the provisions of subsection (f)(3)(C)2., one person cannot serve as the trained operator for two or more facilities simultaneously.
 - (B) Each trained operator shall successfully complete the refresher course of an environmental training program at least once every three years. Evidence of successful completion of each refresher course shall be the date of the course and the instructor's signature on the original record of completion.
 - (C) If the facility has only one trained operator and the trained operator leaves the employ of the facility, the facility shall:
 - 1. Notify the district in writing within 30 days of the departure of the trained operator.
 - 2. Obtain certification for a replacement trained operator within 3 months, except that a trained operator who owns or manages multiple facilities may serve as the interim trained operator at two of those facilities simultaneously for a maximum period of 4 months, by which time each facility must have its own trained operator.
 - 3. If the district determines that the initial course of an environmental training program is not reasonably available, the district may extend the certification period for a replacement trained operator until 1 month after the course is reasonably available.
- (g) **Equipment.** The owner/operator shall not operate dry cleaning equipment after the applicable date shown in column 7 of Table 1, unless the following requirements are met:
 - (1) Prohibited Equipment. The owner/operator shall not operate any of the following types of dry cleaning equipment after the applicable date shown in column 7 of Table 1.
 - (A) A transfer machine, including any reclaimer or other device in which materials that have been previously dry cleaned with perchloroethylene are placed to dry, except a drying cabinet that meets the requirements of item (4)(A) of this subsection.

- (B) A vented machine.
 - (C) A self-service dry cleaning machine.
- (2) Required Equipment. The owner/operator of each new or existing facility shall meet the applicable requirements of Table 1 as follows:
- (A) For an existing facility:
 - 1. Within 12 months of the effective date of this control measure in the district, choose either Option 1 or Option 2 of Table 1 and notify the district of her/his choice.
 - 2. Comply with the requirements of Option 2, notwithstanding her/his choice of Option 1, if the facility does not meet the applicable requirements for Option 1 within 18 months of the effective date of this control measure in the district.
 - 3. Install, operate, and maintain the required equipment shown in column 1 of Table 1 for existing facilities.
 - (B) A new facility shall install, operate, and maintain the required equipment shown in column 1 of Table 1 for new facilities. The applicable requirements shall be determined based on the date the facility commences operation of the dry cleaning equipment.
- (3) Specifications for Required Equipment. Required equipment shall meet the following specifications:
- (A) A primary control system shall:
 - 1. Operate during both the heated and cool-down phases of the drying cycle to reduce the mass of perchloroethylene in the recirculating air stream.
 - 2. Not exhaust to the atmosphere or workroom.
 - 3. Not require the addition of any form of water to the primary control system that results in physical contact between the water and perchloroethylene.
 - 4. For refrigerated condensers only:
 - i. Be capable of achieving an outlet vapor temperature, downstream of any bypass, of less than or equal to 45°F (7.2°C) during cool-down; and
 - ii. Have a graduated thermometer with a minimum range from 0°F (-18°C) to 150°F (66°C), which measures the temperature of the outlet vapor stream, downstream of any bypass of the condenser, and is easily visible to the operator.

5. For equivalent closed-loop vapor recovery systems:
 - i. Use a technology that has been demonstrated, pursuant to the requirements of subsection (h), to achieve a perchloroethylene concentration of 8.600 ppmv or less in each test.
 - ii. Have a device that measures the perchloroethylene concentration, or a demonstrated surrogate parameter, in the drum at the end of each drying cycle, before the machine door is opened and any fugitive control system activates, and indicates if the concentration is above or below 8.600 ppmv. This device shall be installed such that the reading is easily visible to the operator.

(B) A converted machine shall meet all of the following requirements, as demonstrated on-site to the district, either upon conversion or prior to compliance with the requirements of subsection (g)(2)(A):

1. All process vents that exhaust to the atmosphere or workroom during washing, extraction, or drying shall be sealed.
2. The converted machine shall use an appropriately-sized primary control system to recover perchloroethylene vapor during the heated and cool-down phases of the drying cycle.
 - i. A refrigerated condenser shall be considered appropriately sized, for a machine converted on or after the date that this section is filed with the Secretary of State, if all of the following conditions are met:
 - a. The water-cooled condensing coils are replaced with refrigerant-cooled condensing coils.
 - b. The compressor of the refrigerated condenser shall have a capacity, in horsepower (hp) that is no less than the minimum capacity, determined as follows:

$$\text{Minimum Capacity (hp)} = \frac{\text{Capacity of the Machine (lbs)}}{12}$$
 - ii. A refrigerated condenser shall be considered appropriately sized, for a machine converted prior to the date that this section is filed with the Secretary of State, if the conditions a., or b. below are met:
 - a. The refrigerated condenser shall meet the specifications for new conversions in subsection (g)(3)(B)2.i.

- b. The refrigerated condenser shall achieve, and maintain for 3 minutes, an outlet vapor temperature, measured downstream of the condenser and any bypass of the condenser, of less than or equal to 45°F (7.2°C) within 10 minutes of the initiation of cool-down.
 - iii. An equivalent closed-loop vapor recovery system shall be appropriately sized for the conversion of a vented machine if the system does not extend the total drying time by more than five minutes to meet the specifications of subsection (g)(3)(A)5.
- 3. The converted machine shall operate with no liquid leaks and no vapor leaks. Any seal, gasket, or connection determined to have a liquid leak or vapor leak shall be replaced.

(C) A secondary control system shall:

- 1. Be designed to function with a primary control system or be designed to function as a combined primary control system and secondary control system that meets all of the applicable requirements of this section.
- 2. Not exhaust to the atmosphere or workroom.
- 3. Not require the addition of any form of water to the secondary control system that results in physical contact between the water and perchloroethylene.
- 4. Use a technology that has been demonstrated, pursuant to the requirements of subsection (h), to achieve a perchloroethylene concentration in the drum of 300 ppmv or less in each test.
- 5. Have a holding capacity equal to or greater than 200 percent of the maximum quantity of perchloroethylene vapor expected in the drum prior to activation of the system.
- 6. For add-on secondary control systems only, the system shall be sized and capable of reducing the perchloroethylene concentration in the drum from 8600 ppmv or greater to 300 ppmv or less in the maximum volume of recirculation air in the dry cleaning machine and all contiguous piping.

(4) Specifications for Other Equipment.

(A) A drying cabinet shall:

- 1. Be fully enclosed.
- 2. Be exhausted via one of the following methods:

- i. To a control system that has been demonstrated, pursuant to the requirements of subsection (h), to achieve a perchloroethylene concentration of 100 ppmv or less in each test, measured at the outlet without dilution.
 - ii. To a control system that reduces the concentration of perchloroethylene in a closed system with no exhaust to the atmosphere or workroom.
- (h) Equipment Testing.** For a given design, a single test program shall be conducted, in accordance with the following procedures, to meet the specifications in subsections (g)(3) and (g)(4). The person or organization conducting the test program shall prepare a written test plan that describes, in detail, the dry cleaning machine and control systems being tested, the test protocol, and the test method.
- (1) **Test Program and Scope.** A minimum of three tests shall be conducted for each test program on each control system design. All tests for a single test program shall be conducted on a single dry cleaning machine.
 - (A) Test results for a primary control system design, or an add-on secondary control system design, may be applied to a different make/model of dry cleaning machine if the equipment designer or facility demonstrates, to the satisfaction of the district, that:
 - 1. The test results would be representative of the performance of the control system design on the different make/model of dry cleaning machine.
 - 2. The control system design is properly sized for the maximum volume of recirculating air in the dry cleaning machine during the drying cycle.
 - (B) Test results for an integral secondary control system design may not be applied to a different make/model of dry cleaning machine.
- (2) **Test Conditions.** Testing shall be conducted under normal operating conditions, unless otherwise specified.
 - (A) For primary control systems and secondary control systems, each test shall be conducted during the cleaning of one load of materials.
 - 1. The machine shall be filled to no less than 75 percent of its capacity with materials for each test.
 - 2. The weight of materials shall be recorded for each test.
 - (B) A primary control system shall be tested on a closed-loop machine, or a converted machine, without a secondary control system., ,
 - (C) A secondary control system shall be tested on a closed-loop machine.

1. An integral secondary control system shall be tested with the primary control system operating normally.
 2. An add-on secondary control system shall be tested independent of a primary control system and the initial perchloroethylene concentration in the drum shall be 8,600 ppmv or greater.
- (D) For a control system on the exhaust of a drying cabinet, each test shall be conducted following the placement of materials cleaned with perchloroethylene in the drying cabinet. The materials shall be transferred to the drying cabinet and testing shall begin no later than 15 minutes after the end of the washing and extraction process.
1. The drying cabinet shall be filled to no less than 50 percent of its capacity with materials for each test.
 2. The weight of materials shall be recorded for each test.
- (3) Test Method. Equipment shall be tested in accordance with the following methods.
- (A) For primary control systems and secondary control systems:
1. The temperature of the air in the drum shall be measured and recorded continuously during the entire drying cycle, including the operation of the secondary control system.
 2. Sampling shall be conducted as follows:
 - i. For primary control systems and integral secondary control systems, sampling shall begin at the end of the drying cycle and be completed within 5 minutes.
 - ii. For add-on secondary control systems, sampling shall be done when the concentration of perchloroethylene is 8,600 ppmv or greater and again when the concentration reaches 300 ppmv or less.
 - iii. Sampling shall be completed prior to the opening of the machine door and activation of any fugitive control system.
 3. The perchloroethylene concentration in the drum shall be determined by one of the following methods:
 - i. A sampling port and valve shall be appropriately placed to draw a sample from the interior of the drum or the lint filter housing. The sampling port shall be connected to a gas chromatograph by one-quarter (1/4-) inch, outside diameter, Teflon tubing. Any sampling pump shall have Teflon diaphragms. The gas chromatograph shall measure the concentrations of perchloroethylene in accordance with ARB Method 422 (17 CCR, Section 94132, December 31,

1991) or NIOSH Method 1003 (NIOSH Manual of Analytical Methods, U.S. Department of Health and Human Services, August 15, 1987).

ii. A sampling port and valve shall be appropriately placed to draw a sample from the interior of the drum or the lint filter housing. The sampling port shall be connected by one-quarter (1/4-) inch outside diameter Teflon tubing to a Tedlar bag. Any sampling pump shall have Teflon diaphragms. The concentration of perchloroethylene in the air sampled shall be measured in accordance with ARB Method 422 (17 CCR, Section 94132, December 31, 1991) or NIOSH Method 1003 (NIOSH Manual of Analytical Methods, U.S. Department of Health and Human Services, August 15, 1987) within 24 hours of sampling. If an independent laboratory is contracted to perform the analysis of the samples, the chain of custody procedures contained in ARB Method 422 or NIOSH Method 1003 shall be followed.

(B) For a control device on the exhaust of a drying cabinet, sampling and analysis shall be conducted using ARB Method 422 (17 CCR, Section 94132, December 31, 1991) or NIOSH Method 1003 (NIOSH Manual of Analytical Methods, U.S. Department of Health and Human Services, August 15, 1987).

(C) An alternative test method deemed acceptable by the Air Pollution Control Officer or Executive Officer of the district and the Executive Officer of the Air Resources Board.

(4) All test plans and test results shall be made available to the district and the Executive Officer of the California Air Resources Board upon request.

(i) **Water-repelling and Dip Tank Operations.** No person shall perform water-repelling or dip tank operations, after the applicable date shown in column 8 of Table 1, unless all of the following requirements are met:

(1) All materials to be treated with perchloroethylene water-repelling solutions shall be treated in a closed-loop machine, a converted machine, or a dip tank.

(2) For dip tank operations:

(A) The dip tank shall be fitted with a cover that prevents the escape of perchloroethylene vapors from the tank and shall remain covered at all times, except when materials are placed in and removed from the dip tank or while the basket is moved into position for draining.

(B) After immersion, the materials shall be drained within the covered dip tank until dripping ceases.

(C) All materials removed from a dip tank shall be immediately placed into a closed-loop machine or a converted machine for drying and not removed from the machine until the materials are dry.

(j) **Compliance.** A facility shall comply with all provisions of this section as follows:

(1) By the applicable dates of compliance specified in column 1 through column 8 of Table 1.

(2) For compliance with subsection (f)(3) “Environmental Training Requirements”, an alternative date of compliance shall apply if the district determines that the initial course of an environmental training program for perchloroethylene dry cleaning operations is not reasonably available.

(A) For existing facilities in the district, if the initial course is not reasonably available within 12 months of the effective date of this control measure in the district, the alternative date of compliance for subsection (f)(3) only shall be 6 months from the date the district determines that the initial course is reasonably available.

(B) For each new facility in the district, if the initial course is not reasonably available within the period from 3 months prior to 2 months following commencement of operation, the alternative date of compliance for subsection (f)(3) only shall be 1 month from the date the district determines that the initial course is reasonably available.

NOTE

Authority cited: Sections 39600, 39601, 39650, 39655, 39656, 39658, 39659, 39665 and 39666, Health and Safety Code; Sections 7412 and 7416, Title 42, United States Code.

Reference: Sections 39650, 39655, 39656, 39658, 39659 and 39666, Health and Safety Code; Sections 7412 and 7414, Title 42, United States Code; and Sections 63.320, 63.321, 63.323 and 63.324, Title 40, Code of Federal Regulations.

Table 1
Equipment Requirements and Summary of Compliance Times
for Existing and New Facilities

Facility Type	EQUIPMENT REQUIREMENTS		DATES OF COMPLIANCE (after the effective date of this control measure in the district)						
	Compliance Option(s)	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
		Required Dry Cleaning Equipment	Initial Notification	Record-keeping	Annual Reporting	Leak Check and Repair, Operation and Maintenance Requirements	Environmental Training Requirement	Equipment Requirements	Water-Repelling and Dip Tank Requirements
EXISTING FACILITIES	Option 1	Converted Closed-Loop Machine with a Primary Control System	60 days	60 days	Specified by District	60 days	18 mos.	18 mos.	18 mos.
	Or Option 2	Closed-Loop Machine with a Primary Control System	60 days	60 days	Specified by District	60 days	18 mos.	48 mos.	18 mos
NEW FACILITIES Commencing Operation Prior to 18 Months After the Effective Date of This Control Measure in the District									
		Closed-Loop Machine with a Primary Control System	On application for permit	Upon commencement of operation	Specified by District	Upon commencement of operation	3 mos. following commencement of operation	Upon commencement of operation	Upon commencement of operation
NEW FACILITIES Commencing Operation 18 Months or Later After the Effective Date of This Control Measure in the District									
		Closed-Loop Machine with a Primary Control System and a Secondary Control System	On application for permit	Upon commencement of operation	Specified by District	Upon commencement of operation	3 mos. following commencement of operation	Upon commencement of operation	Upon commencement of operation