

**Sec. 4-3. Regulations cumulative; compliance with one provision no defense to noncompliance with another; use of alternative methods.**

(a) *Regulations, methods generally.* The provisions of this chapter, as previously adopted and amended, shall be construed to be cumulative in effect, and it is declared to be the legislative intent that compliance with any one (1) or more provisions of those ordinances or rules and regulations thereof or with any one (1) or more provisions of this chapter shall not be construed as a defense for noncompliance with any other applicable provisions of this chapter. It is explicitly implied that in addition to and consistent with specific methods of sampling and analysis described herein, that samples will be taken in such number, duration and location so as to be statistically significant and representative of the condition which the samples purport to evaluate. Where specific materials, equipment, or procedures are specified, it shall be permissible to use other materials, equipment, or procedures where it has been reliably demonstrated that their use produces results comparable to that which would have been obtained by use of the specified materials, equipment, or procedures.

(b) *Procedures for ambient sampling and analysis.* Sampling and analytical procedures for sulfur dioxide, suspended particulate, photochemical oxidants, carbon monoxide, and non-methane hydrocarbons may be found in Federal Register, Volume 36, Number 84, April 30, 1971. The reference method for sampling and analytical procedures for nitrogen dioxide may be found in Federal Register, Volume 41, Number 232, December 1, 1976. The sampling and analytical procedures for lead may be found in Federal Register, Volume 43, Number 194, October 5, 1978. The procedure for sampling and analyzing atmospheric fluorides shall conform with the method adopted by the American Society for Testing Materials (ASTM) in 1958 and bearing ASTM designation D1606-58T. The director may approve the use of equivalent or alternative sampling procedures.

(c) *Source sampling analysis.* The methods set forth in this section shall be applicable for determining compliance with emission limitations contained in this chapter except where otherwise specifically provided.

(1) *Sample and velocity traverses.* Sample and velocity traverses shall be determined by Method 1 as outlined in Federal Register, Volume 42, Number 160, August 18, 1977, as amended in Federal Register, Volume 43, Number 57, March 23, 1978.

(2) *Stack Gas Velocity Determination.* Stack gas velocity shall be determined by Method 2 as outlined in Federal Register, Volume 42, Number 160, August 18, 1977, as amended in Federal Register, Volume 43, Number 57, March 23, 1978, except in such instances where a Type S pitot tube is not applicable.

(3) *Gas analysis.* Gas analysis for carbon dioxide, oxygen, excess air, and dry molecular weight shall be determined by Method 3 as outlined in Federal Register, Volume 42, Number 160, August 18, 1977, as amended in Federal Register, Volume 43,

Number 57, March 23, 1978, or another type of test procedure that is direct indicating or recording approved by the director.

(4)*Determination of moisture content in stack gases.* Moisture content shall be determined by Method 4 as outlined in Federal Register, Volume 42, Number 160, August 18, 1977, as amended in Federal Register, Volume 43, Number 57, March 23, 1978, or other techniques approved by the director.

(5)*Determination of particulate emissions.* The basic design of the sampling train is left to the individual, if certain criteria are observed to assure high collection efficiency and standard analysis of the collected particulates.

(a) Description of Sampling Apparatus

1. This apparatus shall include interchangeable sampling nozzles or probes, of various diameters, a filter effective for the removal of particulates exceeding 0.3 micron diameter of solid or liquid, a suitable number of impingers to reduce condensible vapors to liquid or solid particulate matter, and appropriate connecting tubing at temperatures above the aqueous dewpoint of the gases. All materials of construction shall be resistant to corrosive elements in the flue, e.g., SO<sub>2</sub>, NO<sub>x</sub>, and elevated temperatures.

2. This filter assembly shall be maintained above the aqueous dewpoint of the flue gases throughout the sampling operation. To accomplish this, the filter assembly may be disposed inside the gas flue to be completely bathed by the hot gas stream; or it may be disposed outside the gas stream, provided the following precautions are taken:

(i) If the filter is disposed outside the hot gas flue, a temperature indicator, e.g., thermocouple, shall be provided at the sample filter gas exit to monitor the filter temperature above the aqueous dewpoint of the flue gases at all times. Auxiliary heating elements for tubing and filter holder shall be provided to maintain specified temperatures when required.

(ii) Deposits in the tube connecting the probe to the exterior filter shall be quantitatively removed by washing with a suitable liquid and by brushing the weight of the solids recovered there from being added to the weight found in the filter.

3. Provisions shall be included for cooling the gas stream to standard conditions (70°F) to reduce condensible vapors to liquids or solid particulate matter, and be formed by condensation of water vapor in the sample. This shall

be accomplished by passage through bubblers provided with an orifice submerged in water through which the gas stream passes at a velocity of approximately 100 meters per second. The bubblers shall be immersed in an ice bath to minimize evaporation. A trap of suitable shape and dimensions for the collection of overflow or overspray shall be provided downstream from the bubblers.

4. An indicating flowmeter shall be provided and preferably located in the train at a point preceding the source of suction, preceded by a trap to prevent condensed water from entering the flowmeter; and a vacuum gauge adjacent to the flowmeter to indicate the absolute of the gas passing through the orifice meter.
5. Operation charges comprising either graphs or tables shall be prepared and be available as a part of the apparatus, to indicate proper sampling rates as a function of gas density in the stack and at the flowmeter.

(b) Analytical results: Analytical results shall be accomplished as outlined in the appendix of Federal Register, Volume 42, Number 160, August 18, 1977, as amended in Federal Register, Volume 43, Number 57, March 28, 1978, for the filter catch and washings up to the filter. Inclusion or exclusion of material collected in the impinger train as "particulate matter" and method of analysis will be determined on an individual air contaminant source basis.

(c) Equivalent methods: Those procedures demonstrated to yield equivalent results and approved by the director may be used for sampling and analysis of particulate matter. Stack sampling methods promulgated by the U.S. Environmental Protection Agency for specified air contaminant sources are considered to be acceptable equivalent methods.

(6) *Measurement of sulfur dioxide in stack gases.* The approved procedure for measuring Sulfur Dioxide in stack gases is the method contained in Chapter 3 of the Tennessee Department of Public Health's January 1975 edition of the Source Sampling Manual, as amended on August 17, 1977. Any method of stack sampling approved by the director may be used in accordance with good professional practice. Stack sampling methods promulgated by the U.S. Environmental Protection Agency for specified air contaminant sources are considered to be acceptable equivalent methods.

(7) *Determination of Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>) in stack gases.* Sulfuric acid in stack gases shall be determined by Method 8 outlined in Federal Register, Volume 42, Number 160, August 18, 1977, as amended in Federal Register, Volume 43, Number 57, March 23, 1978.

(a)Reference: (1) Shell Development Company Method Atmospheric Emission from Sulfuric Acid Manufacturing Processes, Public Health Service Publication 999-AP-13 (1965), Appendix B, pages 85-87.

Reference: (2) Monsanto Company Method Atmospheric Emission from Sulfuric Acid Manufacturing Processes, Public Health Service Publication 999-AP-13 (1965), Appendix B, pages 63-84.

(b)Any method of stack sampling approved by the director may be used in accordance with good professional practice. The stack sampling method promulgated by the U.S. Environmental Protection Agency in Federal Register, Volume 36, Number 247, December 23, 1971, is considered to be an acceptable equivalent method.

(8)*Determination of nitrogen oxides in stack gases.* Nitrogen oxides in stack gases shall be determined by Method 7 outlined in Federal Register, Volume 42, Number 160, August 18, 1977, as amended in Federal Register, Volume 43, Number 57, March 23, 1978.

(9) *Visible emissions evaluation procedures.* The procedure for evaluating visible emissions shall be Method 9 as outlined in Title 40, Code of Federal Regulations Part 60, Appendix A (Revised July 1, 1979) provided, however, the provisions of Section 9, Rule 3, of the Hamilton County Air Pollution Control Regulation shall supplant the averaging provisions of Method 9, except where otherwise provided.

(Code 1968, Sec. 4-21; Ord. No. 7582, Sec. 8, 12-11-79; Ord. No. 7719, Sec. 19, 9-2-80)

THIS IS THE FEDERALLY APPROVED REGULATION AS OF MAY 8, 1990

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