

N.J. STATE LIBRARY  
 P.O. BOX 520  
 TRENTON, NJ 08625-0520

**CHAPTER 27B**

**SAMPLING AND ANALYTICAL PROCEDURES**

**Authority**

N.J.S.A. 13:1D-5, 13:1D-9, 26:2C-8.

**Source and Effective Date**

R.1974 d.360, effective December 30, 1974.  
 See: 7 N.J.R. 48(a).

**Executive Order No. 66(1978) Expiration Date**

Chapter 27B, Sampling and Analytical Procedures, is exempt from Executive Order No. 66(1978).

**Chapter Historical Note**

Chapter 27B, Sampling and Analytical Procedures was adopted as R.1974 d.360, effective December 30, 1974. See: 7 N.J.R. 48(a). Chapter 27B was amended and Subchapters 2 and 3 were adopted by R.1975 d.76, effective March 20, 1975. See: 7 N.J.R. 144(a). Revisions which consolidated the prior text of Subchapter 3 (making it Reserved) with Subchapter 1 became effective June 21, 1986 as R.1986 d.121. See: 8 N.J.R. 223(a). Subchapter 4 became effective January 21, 1985 (operative July 1, 1985) as R.1985 d.3. See: 16 N.J.R. 2894(a), 17 N.J.R. 194(a). Subchapter 3, Air Test Method 3: Sampling and Analytical Procedures for the Determination of Volatile Organic Compounds from Source Operations, was adopted as R.1986 d.377, effective September 8, 1986 (operative October 10, 1986). See: 17 N.J.R. 2194(a), 18 N.J.R. 1800(a).

**CHAPTER TABLE OF CONTENTS**

**SUBCHAPTER 1. SAMPLING AND ANALYTICAL PROCEDURES FOR DETERMINING EMISSIONS OF PARTICLES FROM MANUFACTURING PROCESSES AND FROM COMBUSTION OF FUELS**

- 7:27B-1.1 Definitions
- 7:27B-1.2 Acceptable test methods
- 7:27B-1.3 Operating conditions during the test
- 7:27B-1.4 Sampling facilities to be provided by the person responsible for emissions
- 7:27B-1.5 Sampling train
- 7:27B-1.6 Performance test principle
- 7:27B-1.7 General Testing Requirements
- 7:27B-1.8 Required test data
- 7:27B-1.9 Preparation for sampling
- 7:27B-1.10 Sampling
- 7:27B-1.11 Sample Recovery
- 7:27B-1.12 Analysis
- 7:27B-1.13 Calculations
- 7:27B-1.14 Validation of test

**SUBCHAPTER 2. PROCEDURES FOR THE VISUAL DETERMINATION OF THE OPACITY (PER CENT) AND THE SHADE OR APPEARANCE (RINGELMANN NUMBER) OF EMISSIONS FROM SOURCES**

- 7:27B-2.1 Definitions
- 7:27B-2.2 Acceptable observation methods
- 7:27B-2.3 Observation principle
- 7:27B-2.4 General observation requirements
- 7:27B-2.5 Required observation data
- 7:27B-2.6 Certification

**SUBCHAPTER 3. AIR TEST METHOD 3: SAMPLING AND ANALYTICAL PROCEDURES FOR THE DETERMINATION OF VOLATILE ORGANIC COMPOUNDS FROM SOURCE OPERATIONS**

- 7:27B-3.1 Definitions
- 7:27B-3.2 Sampling and analytical protocol: acceptable test methods
- 7:27B-3.3 Operating conditions during the test
- 7:27B-3.4 Sampling facilities
- 7:27B-3.5 Source operations and applicable test methods
- 7:27B-3.6 Procedures for the determinations of vapor pressures of a single known VOC or mixtures of known and/or unknown VOC
- 7:27B-3.7 Procedures for the direct measurement of volatile organic compounds using a flame ionization detector (FID), a photoionization detector (PID) or a non-dispersive infrared analyzer (NDIR)
- 7:27B-3.8 Procedures for the direct measurement of volatile organic compounds using a gas chromatograph (GC) with a flame ionization detector (FID) or other suitable detector
- 7:27B-3.9 Procedures for the sampling and remote analysis of known volatile organic compounds using a gas chromatograph (GC) with a flame ionization detector (FID) or other suitable detector
- 7:27B-3.10 Procedures for the determination of volatile organic compounds in surface coating formulations
- 7:27B-3.11 Procedures for the determination of volatile organic compounds emitted from transfer operations using a flame ionization detector (FID) or non-dispersive infrared analyzer (NDIR)
- 7:27B-3.12 Procedures for the determination of volatile organic compounds in cutback and emulsified asphalts
- 7:27B-3.13 Procedures for the determination of leak tightness of gasoline delivery vessels
- 7:27B-3.14 Procedures for the direct detection of fugitive volatile organic compound leaks
- 7:27B-3.15 Procedures for the direct detection of fugitive volatile organic compound leaks from gasoline tank trucks and vapor collection systems using a combustible gas detector
- 7:27B-3.16 Procedures for determining the efficiency of gasoline vapor recovery systems at service stations
- 7:27B-3.17 Procedures for the determination of volatile organic compounds emitted from petroleum solvent dry cleaning operations
- 7:27B-3.18 Test methods and sources incorporated by reference

**SUBCHAPTER 4. AIR TEST METHOD 4: TESTING PROCEDURES FOR DIESEL-POWERED MOTOR VEHICLES**

- 7:27B-4.1 Definitions
- 7:27B-4.2 General instructions for all tests
- 7:27B-4.3 Procedures for using a smokemeter to measure the smoke opacity of heavy-duty diesel vehicles and diesel buses
- 7:27B-4.4 Emission control apparatus examination procedure
- 7:27B-4.5 Procedures for establishing and alternative smoke opacity standard for diesel-powered motor vehicles
- 7:27B-4.6 Specifications for a smokemeter for determining compliance with N.J.A.C. 7:27-14
- 7:27B-4.7 through 7:27B-4.15 (Reserved)

**SUBCHAPTER 5. AIR TEST METHOD 5: TESTING PROCEDURES FOR GASOLINE-FUELED VEHICLES**

- 7:27B-5.1 Definitions
- 7:27B-5.2 General instructions for all tests
- 7:27B-5.3 Procedures for the visible smoke test and the idle test for gasoline-fueled motor vehicles
- 7:27B-5.4 Procedures for the 2,500 RPM test

- 7:27B-5.5 Procedures for the ASM5015 test  
 7:27B-5.6 Emission control apparatus examination procedure  
 7:27B-5.7 Procedures for the on-board diagnostics inspection  
 7:27B-5.8 Procedures for the fuel cap leak test  
 7:27B-5.9 Specifications for motor vehicle testing equipment for use in the New Jersey Enhanced Inspection and Maintenance Program

#### APPENDIX 1. THE SAMPLING TRAIN

#### APPENDIX 2. LABORATORY REPORT—STACK SAMPLING

#### APPENDIX 3. DERIVATION OF % ISOKINETIC SAMPLING RATE FORMULA

#### APPENDIX 4. DERIVATION OF EMISSION RATE FORMULA

#### APPENDIX 5. PRELIMINARY STACK TEST DATA

#### APPENDIX 6. NOMENCLATURE

#### APPENDIX 7. (RESERVED)

### SUBCHAPTER 1. SAMPLING AND ANALYTICAL PROCEDURES FOR DETERMINING EMISSIONS OF PARTICLES FROM MANUFACTURING PROCESSES AND FROM COMBUSTION OF FUELS

#### Authority

Unless otherwise expressly noted, all provisions of this Subchapter were adopted pursuant to authority of N.J.S.A. 26:2C-1 et seq. and were filed and became effective on December 30, 1974, as R.1974 d.360. See: 7 N.J.R. 48(a). Revisions to the original rules were filed and became effective on May 20, 1975, as R.1975 d.136. See: 7 N.J.R. 261(d). Further revisions were filed on April 21, 1976, as R.1976 d.121 to become effective on June 21, 1976. See: 8 N.J.R. 223(a).

#### 7:27B-1.1 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise. Terms not defined in this section are intended to be used as defined in the New Jersey Air Pollution Control Act, N.J.S.A. 26:2C-1 et seq., and Chapter 27 in Title 7 of the New Jersey Administrative Code, or are used in their common engineering or scientific sense. Symbols and nomenclature are defined in Appendix 6.

“Bureau” means the Bureau of Air Pollution Control.

“Department” means the Department of Environmental Protection.

“Equipment diameter” means the diameter of a circular cross section having the same area as a noncircular cross section.

“Performance test” or “test” means a series of test runs used for the purpose of determining emissions of air contaminants to the outdoor atmosphere.

“Run” or “test run” means a single integrated measurement or procedure used for the purpose of collecting a sample of air contaminants emitted to the outdoor atmosphere during a specified time interval.

“Sample collector” means any device used to selectively separate and collect a sample of a specified contaminant from a gas stream, including, but not limited to, thimbles, filters, impingers, bubblers, cyclones, condensers and absorbers.

“Sampling location” means the specific position at which a sampling port is located in a stack or chimney.

“Sampling port” means an opening in a stack or chimney into which sampling or measuring devices may be inserted or through which a sample is extracted.

“Sampling rate” means the volume rate at which stack gases are drawn through a sampling train.

“Sampling train” means a combination of entrapment devices, instruments, and auxiliary apparatus arranged in a prescribed sequence to selectively separate and collect samples of specified air contaminants.

“Sampling velocity” means the linear velocity at which stack gases are drawn through the nozzle of a sampling train.

“Stack gas velocity” means the linear velocity (in the direction of gas flow) at which stack gases pass the sampling train nozzle.

“Standard conditions” means 70 degrees Fahrenheit and one atmosphere pressure (14.7 psia or 760 mm Hg).

“Traverse point” means a predetermined point at which a sample or measurement is obtained inside a stack or chimney.

#### 7:27B-1.2 Acceptable test methods

(a) Because of size and/or inertial effects on the particles to be measured, they are to be collected under isokinetic conditions to ensure that the sample is representative. With isokinetic sampling, that portion of the gas stream from which the particles are entrapped is made to enter the sampling nozzle in the same direction and at the same velocity as the gas stream in the stack or chimney being sampled. The sample weight is determined gravimetrically after removal of uncombined water.

(b) Performance tests shall be conducted in accordance with test methods set forth hereinafter. Alternate test procedures, equipment and/or materials of construction may be used subject to prior approval and/or conditions prescribed by the Department. The Department may itself employ such alternates when warranted by test conditions or other circumstances.