Department of Environmental Protection

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David B. Struhs
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DARM-OGG-2

SUBJECT: Guidance on The Use of EPA Methods 18, 25 and 25A for Measuring Gas Stream Volatile Organic Compounds (VOC) Concentration

DATE: March 1, 2000

This memo is to provide guidance concerning the appropriate EPA methods for use in the measurement of VOC concentrations. The commonly used methods are EPA Methods 25 and 25A, and occasionally EPA Method 18. These methods have all been adopted by reference in Rules 62-204.800, and 62-297.401, F.A.C. This memo does not waive any requirement to obtain approval of an Alternate Standard or Procedure (ASP) pursuant to Rule 62-297.620, F.A.C.

Method 25 is the recommended method for the measurement of total gaseous nonmethane organic compound emissions from most air pollution sources - especially combustion sources. The lower limit of detection for EPA Method 25 is 50 ppmv as **carbon.** The presence of water vapor and carbon dioxide may positively bias the results of the method (produce emission measurement results that are higher than true emissions). Pursuant to 40 CFR 60 Appendix A, the bias is not considered to be significant if the product of the volumetric concentrations of water vapor and carbon dioxide is not greater than 100. For example, the bias is not significant for a source having 10 percent CO_2 and 10 percent water vapor, but it would be significant for a source near the detection limit having 10 percent CO_2 and 20 percent water vapor. EPA. Method 25 shall be the required VOC measurement technique whenever its use is required pursuant to the provisions of Chapter 62-204, F.A.C., Chapter 62-296, F.A.C., 40 CFR 60, 40 CFR 61, or 40 CFR 63. Since EPA Method 25 was developed so as to have a uniform response to a wide variety of volatile organic compounds, it is the preferred method for the measurement of VOC emissions from sources controlled by VOC incinerators (afterburners), and sources that emit an unknown mix of organic compounds. Any owner who wants to use another measurement technique (e.g., EPA Method 18 or EPA Method 25A) when EPA Method 25 is required by rule, must apply for and obtain approval of an alternate sampling procedure pursuant to Rule 62-297.620, F.A.C.

Section 1.1 of EPA Method 25A states that EPA Method 25A is applicable to the measurement of the total gaseous organic concentration of vapors consisting primarily of alkanes, alkenes, and/or arenes (aromatic hydrocarbons). Pursuant to Section 1.1 of EPA Method 25, the flame ionization detector used by EPA Method 25A may also be appropriate for the measurement

of organic emissions in gas streams where: (1) compounds consist of only carbon and hydrogen; (2) a single organic compound is known to exist in the gas stream; (3) the relative percentage of each compound and the flame ionization detector response to each of those compounds is known; (4) a consistent mixture of compounds exist both before and after emission control, and only the relative concentrations are to be determined; and (5) the flame ionization detector can be calibrated against mass standards of the compounds emitted. The presence of aldehydes, chlorinated compounds, and certain products of incomplete combustion from sources such as VOC incinerators (afterburners) may cause results obtained with EPA Method 25A to be biased low. EPA EMTIC Guideline Document GD-033 defines the conditions where it may be appropriate to specify the use of EPA Method 25A in lieu of EPA Method 25. EPA EMTIC Guideline Document EMTIC GD-033 states, "The EPA **mandates** the use of Method 25 for measuring gas stream VOC concentration when determining the destruction efficiency (DE) of afterburners. It also allows the use of Method 25A, in lieu of Method 25, under any of the following circumstances: (1) when the applicable regulation limits the exhaust VOC concentration to less than 50 ppmv; (2) when the VOC concentration at the inlet of the control system and the required level of control are such to result in exhaust VOC concentrations of 50 ppmv or less; or (3) if, because of the high efficiency of the control device, the anticipated VOC concentration at the control system exhaust is 50 ppmv or less, regardless of the inlet concentration." The EPA Guideline Document further states, "if a source elects to use Method 25A under option 3, above, the exhaust VOC concentration must be 50 ppmv or less **and** the required DE must be met for the source to have demonstrated compliance. If the Method 25A test results show that the required DE apparently has been met, but the exhaust concentration is above 50 ppmv, this is an indicator that Method 25A is **not** the appropriate test method and that Method 25 should be used." EPA Method 25A shall be the required VOC measurement technique whenever its use is required pursuant to the provisions of Chapter 62-204, F.A.C., Chapter 62-296, F.A.C., 40 CFR 60, 40 CFR 61, or 40 CFR 63. Any owner who wants to use another measurement technique (e.g., EPA Method 18 or EPA Method 25) when EPA 25A is required by rule must apply for and obtain approval of an alternate sampling procedure pursuant to Rule 62-297.620, F.A.C.

EPA Method 18 is applicable to the analysis of approximately 90 percent of the total gaseous organic compounds emitted from an industrial source. The method does not include specific techniques for the identification and measurement of trace amounts of organic compounds such as those found in building air or fugitive emissions. EPA Method 18 is not intended for the measurement of compounds that have a low vapor pressure at stack temperature, high molecular weight polymeric compounds, or compounds that polymerize prior to analysis. The method includes a number of sampling options such as direct interface sampling, dilution interface sampling, evacuated container sampling, and adsorption tube sampling. EPA Method 18 is used to measure emissions from units such as magnetic tape coating facilities; reactor processes, distillation operations, air oxidation unit processes in the synthetic organic chemical manufacturing industry; polymer manufacturing facilities, ethylene oxide sterilizers; and flares. EPA Method 18 shall be the required VOC measurement technique whenever its use is required

pursuant to the provisions of Chapter 62-204, F.A.C., Chapter 62-296, F.A.C., 40 CFR 60, 40 CFR 61, or 40 CFR 63. Any owner who wants to use another measurement technique (e.g., EPA Method 25 or EPA Method 25A) when EPA Method 18 is required must apply for and obtain approval of an alternate sampling procedure pursuant to Rule 62-297.620, F.A.C.

Pursuant to Rule 62-297.620(1), F.A.C., any request for approval of an alternate sampling procedure is to be submitted in writing by the **owner** of the affected source. Any request that is submitted by a consultant should be accompanied by a letter of authorization signed by the owner of the affected source. In order to ensure expeditious processing, the request should be sent to the Professional Engineer Administrator of the Emissions Monitoring Section in the Division of Air Resource Management. All of the information required by Rule 62-297.620(2), F.A.C., must be included in the request. The owner must include a demonstration that the proposed alternate procedure is adequate to demonstrate compliance with the applicable emissions limiting standard pursuant to Rule 62-297.620(2)(d), F.A.C. In some cases the only way to convincingly make the required demonstration may be through the use of simultaneous testing. This may be especially true where approval of EPA Method 25A is sought and the source is known to emit compounds for which the flame ionization detector has a low response (e.g., aldehydes and chlorinated compounds). Where simultaneous testing is necessary, the sampling must pass any audits required in the method as adopted by reference in Rules 62-204.800, and 62-297.401, F.A.C., and the source must be operated in accordance with the requirements of Rule 62-297.310, F.A.C.

The approval of alternate test methods is handled by the Emissions Monitoring Section. Any questions concerning the process for approval of alternate sampling procedures pursuant to Rule 62-297.620, F.A.C., should be referred to M. D. Harley at SunCom 921-9509 or 850/488-0114.

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources Management

EMISSION MEASUREMENT CENTER
GUIDELINE DOCUMENT

MEMORANDUM

SUBJECT: **EPA's VOC Test Methods 25 and 25A**

FROM: John B. Rasnic, Director
Stationary Source Compliance Division
Office of Air Quality Planning and Standards

TO: Air, Pesticides, and Toxics Management Division Directors
Regions I and IV

Air and Waste Management Division Director
Region II

Air, Radiation, and Toxics Division Director
Region III

Air and Radiation Division Director
Region V

Air, Pesticides, and Toxics Division Director
Region VI

Air and Toxics Division Directors
Regions VII, VIII, IX and X

As a result of requests from industry, Regional Offices and State programs, we have reviewed our guidance regarding the use of Methods 25 and 25A for measuring gas stream volatile organic compounds (VOC) concentration. Information obtained during this review has resulted in the following revised guidance, which is effective immediately and which supersedes all previous guidance on this matter. This revision has been coordinated with the other divisions within the Office of Air Quality Planning and Standards.

The EPA has decided to add an option 3 to permit further the use of Method 25A in lieu of Method 25 under certain conditions. Therefore, our new guidance is as follows. The EPA mandates the use of Method 25 for measuring gas stream VOC concentration when determining the destruction efficiency (DE) of afterburners. It also allows the use of Method 25A, in lieu of Method 25, under any of the following circumstances: 1) when the applicable regulation limits the exhaust VOC concentration to less than 50 ppm; 2) when the VOC concentration at the inlet of the control system and the required level of control are such to result in exhaust VOC concentrations of 50 ppm or less; or 3) if, because of the high efficiency of the control device, the anticipated VOC concentration at the control system exhaust is 50 ppm or less, regardless of the inlet concentration.

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Emission Measurement Center, OAQPS

EMC GD-033
April 4, 1995

Further, if a source elects to use Method 25A under option 3, above, the exhaust VOC concentration must be 50 ppm or less and the required DE must be met for the source to have demonstrated compliance. If the Method 25A test results show that the required DE apparently has been met, but the exhaust concentration is above 50 ppm, this is an indicator that Method 25A is not the appropriate test method and that Method 25 should be used.

BACKGROUND

The primary industry impacted by this policy is the printing industry, which has consistently claimed that the Method 25 test procedure is too expensive and cumbersome to be used as a compliance demonstration tool. They have stated that current state-of-the-art technology afterburners routinely achieve 98-99 percent destruction efficiency, generally significantly greater than is required by regulations. As a result, control system outlet VOC concentrations are commonly less than 50 ppm, regardless of the inlet concentration.

Regulations which specify performance requirements for the subject control systems have typically been based on older technology, which was less efficient than current technology. We agree with the printing industry's claim that VOC destruction technology currently available can perform at greater levels than as specified by the regulations. It is therefore appropriate to revise our guidance on the usage of these compliance demonstration methods.

This guidance specifies the circumstances under which Method 25 and Method 25A are to be used. It will reduce the administrative burden on a significant number of regulated industrial sources but will not reduce the stringency of any currently applicable regulatory requirements.

cc: OAQPS Division Directors