§ 53.34 Test procedure for methods for PM
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and sample collection procedure specified in the reference method, but use a different analytical procedure, may be tested by analyzing common samples. The common samples shall be collected according to the sample collection procedure specified by the reference method and shall be analyzed in accordance with the analytical procedures of both the candidate method and the reference method.

(d) Methods for PM$_{2.5}$. Augmentation of pollutant concentrations is not permitted, hence appropriate test sites must be selected to provide the minimum number of test measurement sets to meet the requirements for PM$_{2.5}$ concentrations in the ranges specified in table C–4 of this subpart. Only one test site is required, and the site need only meet the PM$_{2.5}$ ambient concentration levels required by table C–4 of this subpart and the requirements of §53.30(b) of this subpart. A total of 10 valid measurement sets is required.

(e) Collocated measurements. (1) Set up three reference method samplers collocated with three candidate method samplers or analyzers at each of the number of test sites specified in table C–4 of this subpart.

(2) The ambient air intake points of all the candidate and reference method collocated samplers or analyzers shall be positioned at the same height above the ground level, and between 2 meters (1 meter for samplers or analyzers with flow rates less than 200 L/min) and 4 meters apart. The samplers shall be oriented in a manner that will minimize spatial and wind directional effects on sample collection.

(3) At each site, obtain as many sets of simultaneous PM$_{10}$ or PM$_{2.5}$ measurements as necessary (see table C–4 of this subpart), each set consisting of three reference method and three candidate method measurements, all obtained simultaneously.

(4) Candidate PM$_{10}$ method measurements shall be nominal 24-hour (±1 hour) integrated measurements or shall be averaged to obtain the mean concentration for a nominal 24-hour period. PM$_{2.5}$ measurements may be either nominal 24- or 48-hour integrated measurements. All collocated measurements in a measurement set must cover the same nominal 24- or 48-hour time period.

(5) For samplers, retrieve the samples promptly after sample collection and analyze each sample according to the reference method or candidate method, as appropriate, and determine the PM$_{10}$ or PM$_{2.5}$ concentration in μg/m$^3$. If the conditions of paragraph (c) of this section apply, collect sample sets only with the three reference method samplers. Guidance for quality assurance procedures for PM$_{2.5}$ methods is found in "Quality Assurance Document 2.12" (reference (2) in appendix A to this subpart).

(f) Sequential samplers. For sequential samplers, the sampler shall be configured for the maximum number of sequential samples and shall be set for automatic collection of all samples sequentially such that the test samples are collected equally, to the extent possible, among all available sequential channels or utilizing the full available sequential capability.

(g) Calculation of reference method averages and precisions. (1) For each of the measurement sets, calculate the average PM$_{10}$ or PM$_{2.5}$ measurements as the standard deviation, P$_{Rj}$, using equation 8 of this section:

$$P_{Rj} = \sqrt{\frac{\sum (R_i - \bar{R})^2}{N}}$$

Where:

- $R = \text{The concentration measurements from the reference methods}$;
- $i = \text{The sampler number; and}$
- $j = \text{The measurement set number}$.

(2) For each of the measurement sets, calculate the precision of the reference method PM$_{10}$ or PM$_{2.5}$ measurements as the standard deviation, P$_{Rj}$, using equation 8 of this section:

$$P_{Rj} = \sqrt{\frac{\sum (R_i - \bar{R})^2}{2}}$$
§ 53.35 Test procedure for Class II and Class III methods for PM\(_{2.5}\) and PM\(_{10}\).

(a) Overview. Class II and Class III candidate equivalent methods shall be tested for comparability of PM\(_{2.5}\) or PM\(_{10}\) measurements to corresponding collocated PM\(_{2.5}\) or PM\(_{10}\) reference method measurements at each of multiple field sites, as required. Comparability is shown for the candidate method when simultaneous collocated measurements made by candidate and reference methods meet the comparability requirements specified in this section § 53.35 and in table C–4 of this subpart at each of the required test sites.

(b) Test sites and seasons. A summary of the test site and seasonal testing requirements is presented in table C–5 of this subpart.

(1) Test sites. Comparability testing is required at each of the applicable U.S. test sites required by this paragraph (b). Each test site must also meet the general test site requirements specified in § 53.30(b).

(i) PM\(_{2.5}\) Class II and Class III candidate methods. Test sites should be chosen to provide representative chemical and meteorological characteristics with respect to nitrates, sulfates, organic compounds, and various levels of temperature, humidity, wind, and elevation. For Class III methods, one test site shall be selected in each of the following four general locations (A, B, C, and D). For Class II methods, two test sites, one western site (A or B) and one...