

## **FREQUENTLY ASKED QUESTIONS (FAQS) for Method 201A**

- **Are there substantive editorial corrections being considered for the recently signed revisions to Method 201A?**
- **Does the pitot used to perform Method 201A need to be calibrated with the cyclones?**
- **Does Method 201A require extraction and separate reporting of the inorganic and organic condensables from the instack filter? In Section 11.2.1, if the instack filter does not reach constant weight during analysis should the filter be extracted?**
- **Should Method 201A have a section listing the required equipment for sample recovery and analysis. At a minimum the method should specify glass beakers, 50 mL weighing tins, and an analytical balance with a resolution of 0.0001 g (0.1 mg)?**
- **The equation for the sampling rate using only the PM2.5 Cyclone seems inconsistent with the equation using the PM10 or PM10 and PM2.5 combined cyclone. Is there an error in equation 9?**
- **What is the stack blockage area and minimum stack diameter for each variation of the filterable particulate head in Method 201A?**
- **When I use only the PM2.5 cyclone for testing, what should I do if I can't position the cyclone in at the traverse point nearest the stack wall?**
- **What are the acceptable probe liners for a combined Method 201A and 202 sampling train?**
- **Does the variation from isokinetic sampling rate need to be determined at each point to meet the acceptable variation from isokinetic sampling requirement in Section 8.3.4 (b) of Method 201A ?**
- **When are running starts required for Method 201A.?**
- **Are OTM 27 and the revised Method 201A essentially the same? If a facility had been using OTM 27 to test, should requiring Method 201A cause any concern?**
- **Is 100 mL as specified in Sections 8.7.5.5(g) and 11.2.7 sufficient field reagent blank volume to measure the 1ppm residual mass requirement in the method?**
- **Are additional traverse points allowable above the minimum required by Method 201A?**
  
- **Are there substantive editorial corrections being considered for the recently signed revisions to Method 201A?**

**Several editorial changes have been identified and will be corrected in the revisions to reference methods currently being prepared. These clarifications include:**

**In Section 8.3.4 (b)** If the isokinetic range cannot be met (e.g., batch processes, extreme process flow or temperature variation), void the sample or use methods subject to the approval of the

Administrator to correct the data. The acceptable variation from isokinetic sampling is 80 to 120 percent and no more than  $100 \pm 21$  percent (two out of 12 or five out of 24) sampling points outside of this criteria.

**Section 8.3.4.1 contains a calculation error.** The correct conversion from Celsius to Fahrenheit is  $\pm 10$  °C ( $\pm 18$  °F).

**Additional information for the “Note” in Section 8.7.2.2 includes:**

(Note: Commercially-available sampling heads including the PM<sub>10</sub> cyclone, PM<sub>2.5</sub> cyclone, pitot and filter holder have a projected area of approximately 31.2 square inches when oriented into the gas stream. As the probe is moved from the most outer to the most inner point, the amount of blockage that actually occurs ranges from approximately 13 square inches to the full 31.2 square inches plus the blockage caused by the probe extension. The average cross-sectional area blocked is 22 square inches

**Additional information for the “Note” in Section 8.7.5.5 (a) Container 1 includes:**

(Note: If the test is conducted for PM<sub>10</sub> only, then Container #1 would be for less than or equal to PM<sub>10</sub> micrometer filterable particulate.)

**Section 10.1 refers to Method 4A or 5 of appendix A-3 part 60.**

This reference should refer to Method 1 and 2.

**Section 10.5 is not needed because there is no titration or other requirements necessitating Class A volumetric glassware in the method**

**In Section 12.1 on Nomenclature** the variable V<sub>b</sub> and its definition are not needed since there is no IC analysis required in the method

**In Section 12.5 Equations** there is a typographical error in the coefficient in Eq. 8. The correct coefficient is 0.0060639.

• **Does the pitot used to perform Method 201A need to be calibrated with the cyclones?**

Yes, in Section 10.1.3 the pitot tube calibration in Method 201A must be done assembled with the cyclone hardware. The intent of the section is to have you determine the pitot tube coefficient based on physical measurement techniques described in Method 2 of appendix A-1 to part 60. You must calibrate the pitot tube on the sampling head because of potential interferences from the cyclone body. Refer to Section 8.7.2 of Method 2 for additional information. The design of the nozzles for Method 201A provides distance to avoid the aerodynamic influences of blockages due to the cyclones. These aerodynamic influences affect the pitot unless the measurement plane is at the nozzle entrance and there is sufficient offset. It

is difficult to impossible to construct and use a cyclone sampling system with the pitot at the nozzle entrance (even for the shortest nozzle). The airflow at the pitot location will not be the same as at the nozzle. The airflow is also likely to be different if the pitot is mounted on the nozzle side than if mounted on the side opposite the nozzle. As a result of these aerodynamic influences, we included in the method a requirement to determine the pitot coefficient for the combined cyclone/pitot arrangement.

- **Does Method 201A require extraction and separate reporting of the inorganic and organic condensables from the instack filter? In Section 11.2.1, if the instack filter does not reach constant weight during analysis should the filter be extracted?**

In Section 11.2.1 if constant weight requirements cannot be met the Method 201A filter weight should be reported and flagged. In the published Method 201A we only discuss extraction of the filter to achieve constant weight when they maintain the filter temp below 85 F. The intent of the section is:

Container #1, Less than or Equal to PM<sub>2.5</sub> Micrometer Filterable Particulate. Transfer the filter and any loose particulate from the sample container to a tared weighing dish or pan that is inert to solvent or mineral acids. Desiccate for 24 hours in a dessicator containing anhydrous calcium sulfate. Weigh to a constant weight and report the results to the nearest 0.1 mg. (See Section 3.0 for a definition of Constant weight.) If constant weight requirements cannot be met, data should be reported and flagged as a minimum value. (Note: Regardless of the stack temperature you are not required to speciate the Method 201A nozzle, front half or in-stack filter sample into organic and inorganic fractions. Neither Method 17 nor 201A require separate analysis of the filter for inorganic and organic PM. Since the instack filter samples collected at  $\leq 30$  °C (85 °F) may include both filterable insoluble particulate and condensable particulate, the filter should be weighed after desiccation but not extracted since insoluble particulate will not be recovered from the extraction.)

- **Should Method 201A have a section listing the required equipment for sample recovery and analysis. At a minimum the method should specify glass beakers, 50 mL weighing tins, and an analytical balance with a resolution of 0.0001 g (0.1 mg)?**

The intent and procedures in Method 201A include the use of appropriate weighing tins and glassware. These equipment/materials were not included in Section 6.3 but are referred to elsewhere in the method. Based on the detection limits of Method 201A we require at a minimum an analytical balance with a resolution of 0.0001g (0.1g). Testers and laboratories performing the particulate mass measurement may choose to us balance of 0/00001g (0.01mg) but this is not required in the method.

- **The equation for the sampling rate using only the PM2.5 Cyclone seems inconsistent with the equation using the PM10 or PM10 and PM2.5 combined cyclone. Is there an error in equation 9?**

There is a typographical error in the coefficient in Eq. 8 of Method 201A. The correct equation is:

Sampling Rate Using Only PM<sub>2.5</sub> Cyclone.

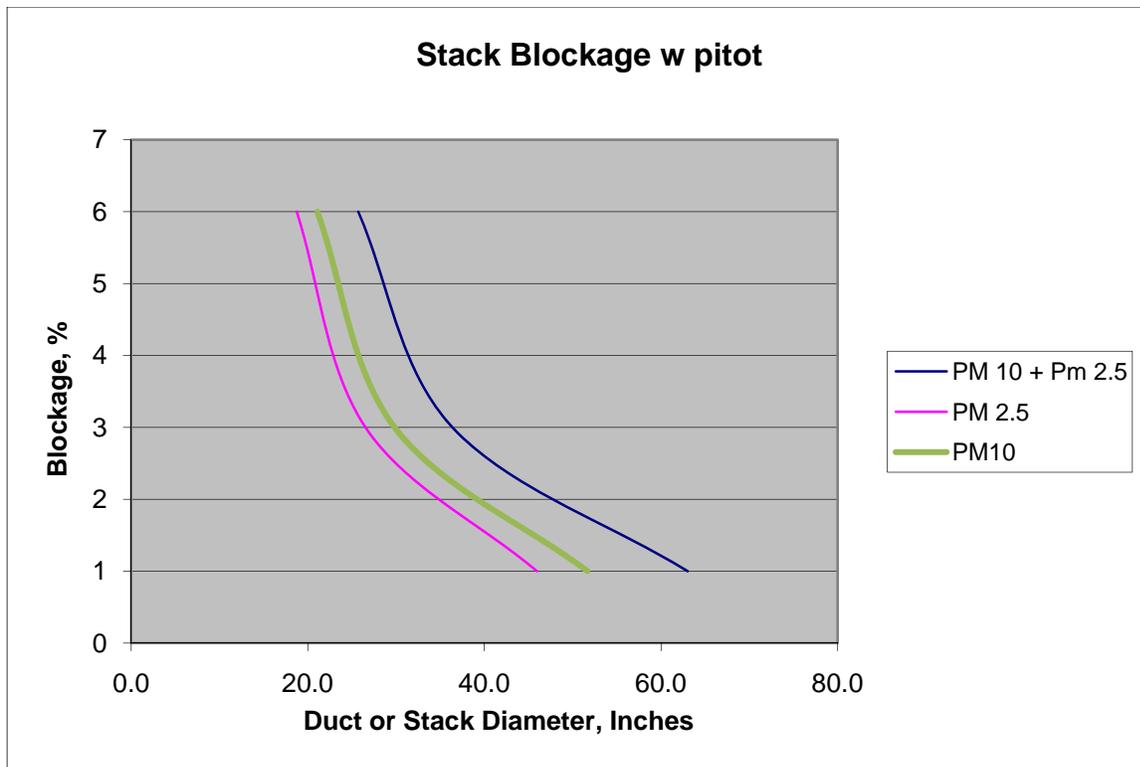
For N<sub>re</sub> Less than 3,162:

$$Q_{IV} = 0.0060639 \left[ \frac{\mu}{C^{0.4242}} \right] \left[ \frac{P_s M_w}{T_s} \right]^{-0.5759} \left[ \frac{1}{D_{50}} \right]^{0.8481} \quad (\text{Eq. 8})$$

- **What is the stack blockage area and minimum stack diameter for each variation of the filterable particulate head in Method 201A?**

Table 1. Estimated minimum stack diameter for filterable particulate cyclone configurations

	<b>3% Blockage Minimum Stack Diameter W/O Pitot (in)</b>	<b>6% Blockage Minimum Stack Diameter W/O Pitot (in)</b>	<b>3% Blockage Minimum Stack Diameter W Pitot (in)</b>	<b>6% Blockage Minimum Stack Diameter W Pitot (in)</b>
<b>PM2.5</b>	20.8	14.7	26.5	18.8
<b>PM10</b>	24.9	17.6	29.8	21.1
<b>PM10+PM2.5</b>	32.4	22.9	36.4	25.7



There are several variables that are at play. First, not all cyclone sets will have the same exact outside dimensions. We assumed the minor differences would not make a significant difference in the overall area (i.e. if the cyclone is 1/8" bigger or smaller in all dimensions). At each point in the traverse, the cyclones and probe will block different amounts of the stack area. For the smallest stack diameter, the point closest to the port may only have half of the PM10 cyclone in the stack and therefore not be blocking much of the stack diameter. When fully inserted, the entire cyclone set will be in the stack and some of the probe sheath, Pitot, and temp sensor.

- **When I use only the PM2.5 cyclone for testing, what should I do if I can't position the cyclone in at the traverse point nearest the stack wall?**

Unlike the PM10 cyclone, the nozzle for the PM2.5 cyclone is not at the furthest point from where it is connected to the probe. Under some conditions, the end of the cyclone will touch the far stack wall and the probe not be at the furthest point. In this case, you should sample at the furthest point that can be reached for twice as long (or three times if they cannot reach the last two points). You should be able to sample at points that are 1.6" or more from the stack or duct wall.

- **What are the acceptable probe liners for a combined Method 201A and 202 sampling train?**

The method combination allows the use of alternative probe liners if you request and alternative as allowed in Section 6.15 of Method 201A that refer to alternative probe liner materials in Section 6.11.2 of Method 5. As noted in the rule, permission must be obtained from the regulatory authority which established the limitation to use alternative liners such as titanium for high temperature sampling.

- **Does the variation from isokinetic sampling rate need to be determined at each point to meet the acceptable variation from isokinetic sampling requirement in Section 8.3.4 (b) of Method 201A ?**

The individual isokinetic point variation has always been part of the method. We allow a percentage of points as specified in the method to deviate from the required isokinetic sampling rate since testers are requesting to conduct more than 12 points.

- **When are running starts required for Method 201A.?**

Running starts are required every time the sampling train is restarted after the initial traverse point is measured. That includes running starts at a port change and any time the cyclone heads are removed from the stack for nozzle changes. The initial “warm up” prior to sampling at the first traverse point does not require a running start. The purpose is to address the potential for material collected in the cups to stay in place and not become free to move from the area where they would be considered greater than a specified size to less than the size. This is more of a problem when sampling vertically.

- **Are OTM 27 and the revised Method 201A essentially the same? If a facility had been using OTM 27 to test, should requiring Method 201A cause any concern?**

If the source was using OTM 27 (and 28) for measuring either PM10 or PM2.5 then using the revised reference methods Method 201A (and 202) should not be a concern and should give equivalent results.

- **Is 100 mL as specified in Sections 8.7.5.5(g) and 11.2.7 sufficient field reagent blank volume to measure the 1ppm residual mass requirement in the method?**

The promulgated method specifies 200 mL of acetone be collected as the Acetone field reagent blank. Section 11.2.7 specifies 150 mL of acetone be used for the field reagent blank determination. These volumes were determined based on typical field recovery volumes for Method 201A. If the residue from this determination is below the detection limit of the analytical balance, then the solvent meets the confirmatory criteria for field solvent blank contamination in the method.

- **Are additional traverse points allowable above the minimum required by Method 201A?**
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Additional points above the minimum are acceptable without approval as long as they follow the general guidance for traverse point selection and representativeness in the method. For example, square ducts with an odd number of points may require additional traverse and sampling points to represent the flue gas particulate profile.

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