

Method 202 Assessment and Evaluation for Bias and Other Uses
Evaluation of Stakeholder Recommendations
April 29, 2008 through July 2, 2008
INDEX

Index	Date	Stakeholder	Subject
1	April 29, 2008	Jim Serne	Dry Impinger Method
2	May 9, 2008	Doris Montecastro	RE: Question about the Dry Impinger Method for Determining CPM from Stationary Sources
3	May 14, 2008	Lee Carlson	RE: Dry Impinger Method
4a	May 27, 2008	Lee Carlson	Re: OTM-27 Errors
4b	May 27, 2008	Lee Carlson	Fw: Error on OTM-27 Equation No. 9
5	May 27, 2008	R. Owens/C. Duncan	RE: Dry Impinger Method
6	July 11, 2008	James R. MacNeal	Re: Questions
7a	June 18, 2008	J. Bruce Nemet	Re: OTM 028 CPM Filters
7b	July 7, 2008	J. Bruce Nemet	Follow-up phone call
8	June 25, 2008	Charles Barney	Method 202 Comment.pdf
9	June 28, 2008	Pete Rossmiller	Fw: Re: OTM 28 Ultrasonic Filter Extraction
10	July 1, 2008	Leslie Sue Ritts	Re: OTM 27-28 Comments.pdf – Adobe Acrobat Standard
11	July 2, 2008	Giedrius Ambrozaitis	Re: Alliance Comments on OTM-27 and PTM-28
12	July 2, 2008	John Woolf	Re: CIBO OTM-27, OTM-28 Comments

Method 202 Assessment and Evaluation for Bias and Other Uses
Evaluation of Stakeholder Recommendations
April 29, 2008 through July 2, 2008

Date and Index #	Stakeholder	Comment/Question/Recommendation	EPA Response/Conclusion
Topic: Dry Impinger Method			
4/29/07 (1)	Jim Serne, PE VP, Project Director, TRC Environmental Corporation	<p>1. Can you add 82.6 mm sized filters to the filter description?</p> <p>2. Baking at 300°C (572°F) seems too high. At that temperature the impinger O-rings (Viton) may melt or crack. Could you lower that to 200°C or 400°F?</p> <p>3. Why analyze three of each type of reagent blanks? Now that the field blank train is used to blank correct, it is unnecessary (or worth the added cost) for the lab to analyze three of each type of reagent blanks. One reagent blank for the water, acetone, and methylene chloride is adequate to see if there is reagent contamination.</p> <p>4. Are the audit samples in Sections 9.10, 9.11, and 9.12 needed? There are no CPM Audit Samples available and I don't think it would be useful to create or require them.</p> <p>5. Equation 4 in Section 12.2.4 is incorrect: The subscript f (mass collected on the CPM filter) is no longer relevant. The Teflon® filter is not weighed anymore.</p>	<p>1. The method has been modified to allow Teflon® Membrane filters over the typical range used by test firms.</p> <p>2. Baking glassware at 300°C is based on laboratory practice to attain the lowest condensable blank possible. Baking glassware at less than this temperature runs the risk of higher blank values that could bias results high. Viton O-rings may need to be removed prior to baking the glassware.</p> <p>3. The method has been modified to require analysis of one of each type reagent blank. Testing firms run the risk of high bias in their sample results if they don't confirm reagents meet the purity specifications in the method. The reagent blanks are a recommendation based on experience with the method. Reagent blank results are not used to correct the test results.</p> <p>4. A provision for audit samples is in the method to allow for subsequent development and distribution of these materials. An audit material already exists for Method 315 and similar materials can easily be developed for OTM 28. EPA and the testing community would be well served if an audit sample were developed to evaluate how well the procedure is executed in test labs.</p> <p>5. Equation 4 in Section 12.2.4 has been corrected.</p>
Topic: Question about the Dry Impinger Method to Determining CPM from Stationary Sources			
5/9/09 (2)	Doris Montecastro, PhD, Environmental Engineer, Ashworth	Is the method valid for sources that have ammonia slip?	EPA is developing the method for applicability to all sources. We have gone a long way to inhibit artifact formation and therefore expect that if the method collects the material then it is PM. At some future time when a method that better replicates

Date and Index #	Stakeholder	Comment/Question/ Recommendation	EPA Response/Conclusion
	Leininger Group		<p>particulate formation in the atmosphere becomes widely available, we may have better information upon which to change this assertion.</p> <p>At high stack temperatures (>350°F) ammonia is inhibited from chemically reacting with acid gases. If ammonia chemically combines with another reactive acid stack gas (SO_x, NO, etc.) at a reduced temperature (in the stack or when released to the atmosphere), then it is considered particulate matter emissions. We performed a limited number of lab experiments with the addition of ammonia in the presence of SO₂, NO and NO₂ and did not find any reaction products or CPM even though we expected there to be a reaction. One stakeholder has sponsored limited experiments to test the CPM method collection efficiency for sulfuric acid. We will do some limited experiments to evaluate the effect of ammonia on CPM with different SO₂, SO₃ and H₂O experiments are present in test gas mixtures.</p>
Topic: RE: Dry Impinger Method			
5/14/08 (3)	Lee Carlson, Senior Research Associate, NCASI Southern Regional Center	What apparatus is to be used for the extraction? Section 6, Equipment and Supplies, contains no description of the extraction apparatus. What materials of construction?	The short answer is that the filters must be extracted by sonication with the solvents required in the method. EPA has not specified the sonic bath or the extraction glassware because any extracting glassware will work as long as it is clean and will hold the requisite amount of solvent, submerge the filter, and provide a boundary to the extraction vessel that can be put in the sonic bath without contaminating the sample. A 50 mL glass tube seems the most efficient, but a beaker or any other vessel that meets the minimum qualifications above will do. The container must be glass because that's the standard material for extraction when organic solvents are involved.
Topic: RE: OTM-27 Errors			
5/27/08 (4)	Lee Carlson, Senior Research Associate, NCASI Southern	In Equation 42, the term for the density of acetone appears in subscript font and should be in full size font to prevent confusion. In Equation No. 43,	EPA will revise the methods and re-post the updated versions on the OTM Web site.

Date and Index #	Stakeholder	Comment/Question/Recommendation	EPA Response/Conclusion
	Regional Center	<p>the subscript denoting concentration for total filterable particulate should read C_{tf} as listed in the definition of variables section.</p> <p>In Equation 9, the term for barometric pressure has been left out of the denominator in the right most term of the equation.</p>	
Topic: RE: Dry Impinger Method			
5/27/08 (5)	Roy Owens Owens Corning Chuck Duncan General Electric	<p>1. In OTM 27 testing, we were using only the PM2.5 head. We were using a 47 mm filter for the CPM filter. We were unable to achieve a flow rate anywhere close to the rate required for isokinetic sampling. This was with 28 inches of vacuum. One of the solutions we had was to put a glass/quartz fiber filter as a backing. This worked at first. However, the flow rate dropped off rapidly. It was assumed that due to the loading of fine particulate that the holes were becoming plugged. The source container no organic emissions.</p> <p>2. The filter holder had 60 holes in the filter support. TRC measured the size of the holes and calculated the area that was available for air to pass through. The total area of the 60 holes was about 9.1% of the total 47 mm filter. Initially, the O ring we used was so large that it covered all but 26 holes. This meant that at first we only had 4.1% of the area of a 47 mm filter available for air flow.</p>	<p>1. EPA spoke with Jim Serne about his experience with using Teflon® membranes and he stated that he has not had any problems. EPA did not ask him what size filters he was using. We have found that the pressure drop across 47 mm is too high if the flow rate is above 0.5 cfm regardless of the backer used to support the filter. The pressure drop across a 101.6 mm Teflon® Membrane filter was within operating parameters at flowrates between 0.5 and 1.0 cfm using a Teflon® filter support with concentric rings to allow more surface area of the filter to the downstream vacuum. Fiberglass filter supports may shed glass shards that will bias the CPM results high. We believe fiber supports to the CPM filter should be avoided.</p> <p>2. TRC used 83 mm Teflon® membrane filters on Teflon® supports. TRC pulled about 200 cubic feet of sample at 4 percent moisture and had no pressure problems. TRC kept the CPM filter temp between 80° to 84°F.</p>

Date and Index #	Stakeholder	Comment/Question/ Recommendation	EPA Response/Conclusion
Topic: Questions			
6/11/08 (6)	James R. MacNeal, Director, Innovation and Commercial Development Specialty Gases of America, Inc.	<p>Regarding the use of N₂ as a purge agent in Method 202, OTM 27, and OTM 28:</p> <ol style="list-style-type: none"> 1. What is the quantity of N₂ required for purging per procedure; 20 liters per minute for 60 minutes = 1,200 liters? 2. Is a filter required for the N₂ and if so what mesh? 3. Is there any other requirement for N₂, other than the main purge as described above and if so what quantity per procedure is required? 	<p>1. Typical sampling rates are 14 to 28 L/min per minute. EPA is requiring purge for 1 hour at the approximate sampling rate used while the sample was collected. So that means the estimated maximum volume of the nitrogen used in the purge would be about 1,680 L, not counting use or loss during the setup.</p> <p>You can figure how much nitrogen you want left in the cylinder at the end of the purge and the associated total volume of gas needed for a purge. We've been using UHP compressed nitrogen in large lab size cylinders so we've always had an excess, and we don't take cylinders below a 250 psig pressure.</p> <p>2. The filter for the purge gas should be selected or treated so it collects any fine particulate that might originate from the cylinder, regulator, or connecting tubing and the filter should not contribute any mass to the gas stream (e.g., glass shards, metal fragments etc.) A good assumption is that it should be as efficient as filters specified in Method 5. My preference is a 47 mm Teflon® filter, but you may have others in mind that meet the intent, such as sintered steel.</p> <p>3. Section 7.1.5 addresses the use of Ultra-High Purity nitrogen. There is no consistent standard across vendors on how one determines the nitrogen to achieve this specification. The important parameters for use with Method 202 and OTM 28 are that there not be a measurable mass of organic material or inorganic material that would be retained in the collected water or on the CPM back up filter. For organic compounds, this could probably be limited to MeCl soluble organic compounds with molecular weight more than about 132 or that would be absorbed in water and combine with gasses and other organic compounds collected in the water. For inorganic vapors and gases, this might include compounds like ammonium nitrate, ammonium sulfate, etc. and even ammonia gas.</p>

Date and Index #	Stakeholder	Comment/Question/ Recommendation	EPA Response/Conclusion
			<p>The reason that we are specifying the UHP nitrogen and a filter is that several test contractors have traced high results to contaminated nitrogen delivered to them from gas suppliers. They have also reported high blanks in the reagents they have used. These situations have provided us support for including the procedure to verify the residue content of the reagents both prior to taking the reagent into the field and for collecting field blank of the reagents and then performing a field run blank. We believe that having this information may help a tester explain high values during a sampling event if it is due to poor reagents or gas.</p>
Topic: OTM 028 CPM Filters			
<p>6/18/08 (7a)</p> <p>7/7/08 (7b)</p>	<p>J. Bruce Nemet, QA Officer, Resolution Analytics, Inc.</p>	<p>1. I am attempting to locate back half CPM filters for OTM-028. Have you located any filters that work well with this method and/or have you determined any particular type or manufacturer that is more suitable than the others?</p> <p>2. Incidentally, we have thus far performed several of these methods in-house and they work reasonably well (with low sulfate artifact) although the water fractions take a considerable amount of time to go dry at the 85°F temp. Also, I have been subtracting the individual fractions (organic vs inorganic field blank PM) from their corresponding sample fractions. The method states that a total CPM Field Blank mass is to be subtracted from each total sample CPM mass but this doesn't make any sense to me.</p> <p>3. During the organic extraction, an emulsion formed in the field blank sample. Why did this form and</p>	<p>1. It's important that the Teflon® filter have the proper filter holder support. A flat Teflon® disk with holes drilled in it will not let sufficient gas through. Our Teflon® holders have concentric grooves that permit gas to be drawn through a larger area on the filters once pump vacuum is applied.</p> <p>The reason for the Teflon® filter is to avoid filter charcs contributing to the mass of the CPM, so clearly fiberglass, quartz, or Teflon® coated glass fiber filters that throw off charcs when the filters are sonicated will bias the CPM results high.</p> <p>The filter specification for OTM 028 CPM nominally requires the same collection efficiency as Method 5. We have found that the 47 mm ambient air filter meets these specifications. We've also found a 90 mm filter supplied by Pall that meets the ASTM DOP retention criteria. Pall offers a 1 um in the 90 mm Zefluor and 8/10 Teflon® membrane sheets that can be cut to appropriate diameters for other filter holders.</p> <p>We've done some preliminary pressure drop experiments with our setup consisting of a Method 5 front half and an OTM 28 back half. The 47 mm filter has a significant pressure drop and seems to have adequate flow at 0.5 cfm but not much higher (pressure drop, 4 inches of Hg at 0.5 cfm, 8 at 0.75</p>

Date and Index #	Stakeholder	Comment/Question/ Recommendation	EPA Response/Conclusion
		<p>how can we eliminate the emulsion?</p>	<p>cfm and 16 at 1cfm).</p> <p>We have a 4-inch Teflon® membrane filter that provides better flow, obviously. These filters were cut from an 8/10 sheet so we had to be careful to remove cutting debris from the edges. The 4-inch Teflon® discs showed a dry pressure drop at 1 cfm of about 9 inches of Hg (pressure drop, inches of Hg. 2.5 at 0.5 cfm, 5.0 at 0.75 cfm, 9.0 at 1 cfm).</p> <p>2. Since the field blank contains solvents that (hopefully) are equivalent to the solvents used for analysis of the actual samples, the tester is provided with the potential to correct data when one solvent has a little higher blank but the others are lower. EPA selected using the field blank to get the combined residue for recovering, extracting, and processing the test samples. The individual blanks of the solvents will assist the source tester or lab technician to problem solve a field blank that exceeds the allowable blank subtraction. It also provides the tester a better idea of where they need to improve their technique.</p> <p>3. EPA notes that the commenter’s laboratory used the acetone/methylene chloride rinse in the first extraction. OTM 28 specifically directs testers to use fresh solvent during extraction of the aqueous sample. The method is written to avoid formation of emulsion caused by the mixed acetone/methylene chloride solvent used in the train rinse.</p>
Topic: Method 202 Comment.pdf			
6/25/08 (8)	Charles J. Barney, P.E., Assistant General Manager, Grand River Dam Authority, Chouteau, OK	Our review available of technical evaluations of Method 202 leads us to conclude it is inaccurate for testing of coal fired boilers. This issue will become even more important as utilities such as ours are faced with obtaining guaranteed performance for hugely expensive emission control equipment. An <u>accurate</u> and	With respect to the measurement situation that you experienced with the use of Method 202 as promulgated in the Federal Register, you will notice in the text describing what EPA is doing to improve Method 202 that: 1) EPA Method 202 as promulgated could have a sulfate artifact of up to 250 mg if the nitrogen purge was omitted (an allowed option under specified conditions). 2) The artifact level could be reduced to about 10 to 15 mg with the use of the nitrogen purge.

Date and Index #	Stakeholder	Comment/Question/ Recommendation	EPA Response/Conclusion
		<p>consistent test method is essential. The Method 202 is fatally flawed for use with coal fired boilers, and the proposed improvements to date appear to be inadequate solutions.</p>	<p>3) The method has the potential for producing highly variable results due to the numerous options in the method as promulgated.</p> <p>4) Through some minor modifications of the glassware, sample collection procedures and sample analysis procedures combined with using a single set of sampling and analysis procedures, the sulfate artifact is reduced to the demonstrated detection limit of the method (1 to 2 mg) and the precision is improved.</p> <p>5) Some notable stakeholders that are active participants of the project include the Electric Power Research Institute, National Council for Air and Stream Improvement (pulp and paper industry), American Petroleum Institute, Portland Cement Association, Utility Air Resource Group, Automotive Alliance, National Association of Clean Air Agencies (State and Local Air Agencies) and Environment Canada.</p> <p>6) We have posted the dry impinger test method to the “Other Test Methods” Web page and the Agency will work with stakeholders to encourage the use of this improved test method.</p> <p>The next time you test your boilers, request that the State allow you to use OTM 28 (unless we have promulgated a replacement for Method 202). In addition, you would be well served to use a good test contractor that takes care to use clean glassware and follows good sampling techniques to reduce contamination of the sample. At very low particulate concentrations as you may have, eliminating potential contamination from poor technique is imperative.</p>
Topic: FW: Re: OTM 28 Ultrasonic Filter Extraction			
6/28/08 (9)	Pete Rossmiller, Barr Engineering Co., Minneapolis, MN	<p>OTM 28 method, Section 11.2.1 (filter extraction) mentions the use of a 50 mL “extraction tube” and a sonication bath. Can you elaborate further on the equipment (extraction tube and sonication bath) that was used/intended for this method?</p> <p>Was there any advantage or</p>	<p>The device described appears to achieve the same function as placing the beaker or tube in a bath. The downside would be that the lab would have to be careful that the probe (horn) does not contaminate the sample.</p>

Date and Index #	Stakeholder	Comment/Question/ Recommendation	EPA Response/Conclusion
		preference as to using a sonic bath (extraction tube in water) or probe/horn style sonicator placed into the extraction tube with the filter and solvent?	
Topic: OTM 27 – 28 comments.pdf – Adobe Acrobat Standards			
7/1/08 (10)	Leslie Sue Ritts, Ritts Law Group, PLLC, Alexandria, VA	National Environmental Development Association’s Clean Air Project, the Alliance of Automobile Manufacturers, and the Council of Industrial Boiler Owners shared several concerns:	1. While it would be beneficial to all if the size of the OTM 27 sampling head could be reduced in size, the laws of physics are against us. We will assemble the documents that we have that were provided to EPA for the initial design of the five stage cyclone system to place in the docket. In addition, we will contact the particle physicist that designed the device to get some additional information on the impacts that would result if the equipment was made smaller. EPA believes that the size was established such that it would collect a representative sample of the particulate in the stack and that would minimize the time required to collect a mass that could be weighed on the typical scales available to stack samplers.
7/2/08 (11)	Giedrius Ambrozaitis, Alliance of Automobile Manufacturers	1. the size of the testing apparatus and whether it can be easily accommodated on the majority of stacks.	
7/2/08 (12)	John Woolf, Government Relations & Strategy, Bracewell & Giuliani, LLP	2. how to maintain the sampling device temperature at stack conditions.	
		3. sources for which nitrate and sulfate interferences are not detected should be able to eliminate the extraction process and determine the PM fractions gravimetrically after sonication.	2. Regarding how to maintain sampling device temperature, for many stacks, portions of the cyclones and filter will be external to the stack during part of the sampling traverse. Therefore, you must heat or insulate portions of the cyclones and filter that are not within the stack in order to maintain the sampling head temperature at the stack temperature. Maintaining the temperature will insure proper particle sizing and prevent condensation on the walls of the cyclones.
			3. Regarding sources for which nitrate and sulfate interferences are not detected, since EPA does not know the composition of CPM from all source types, we recommend the CPM filter be processed as described in the method. Running the method as written will ensure consistency in the development of emissions and emission factors for all sources tested.

Date and Index #	Stakeholder	Comment/Question/ Recommendation	EPA Response/Conclusion
Topic: Alliance Comments on OTM-27 and OTM-28			
7/2/08 (11)	Giedrius Ambrozaitis, Alliance of Automobile Manufacturers	See Comment #10	See response to Comment #10
Topic: Re: CIBO OTM-27, OTM-28 Comments			
7/2/08 (12)	John Woolf, Government Relations & Strategy, Bracewell & Giuliani, LLP	<p>See Comment #10</p> <ol style="list-style-type: none"> 1. EPA should ensure that typical test handling of the equipment will not induce an unpredictable bias 2. EPA should develop and include information regarding method precision and bias determined through testing on various types of fuels and conditions. 	<p>See response to Comment #10</p> <ol style="list-style-type: none"> 1. EPA agrees that mishandling or tipping the cyclones during movement from port to port between traverses or during sample recovery can bias the results. We believe the method is clear and it is up to the tester to ensure quality of the samples collected. 2. EPA plans to perform evaluations of precision and bias of the combined OTM 27 and 28 at a source that contains both condensable inorganic and condensable organic matter. EPA welcomes stakeholders to evaluate the fine particulate method (OTM 27 and 28) at other source categories.

From: "Serne, Jim (Raleigh,NC-US)" <JSerne@TRCSOLUTIONS.com>
To: <Myers.Ron@epamail.epa.gov>, "Ray Merrill" <Ray.Merrill@erg.com>
CC: "J. Bruce Nemet" <Resolute1@charterinternet.com>
Date: 4/29/2008 4:19 PM
Subject: Dry Impinger Method

Index 1

Ray & Ron,

I have reviewed the April 28th version of the Dry Impinger M202 and have a few initial comments/ corrections. I gave Bruce Nemet a copy to review in preparation for the sampling we start next week.

My initial comments are as follows (by page #)

page 7 and 9: Teflon filters are available in an 82.6 mm size which many test firms use (including TRC) Can you add that size to the filter description?

page 13, Baking at 300 C (572 F) seems too high. At that temperature the impinger O-rings (Viton) may melt or crack.

Could you lower that to 200 C or 400 F ?? It would make the glassware prep more practical and not result in O-ring damage.

page 22, Why analyze three of each type of Reagent Blanks? Now that the Field Blank Train is used to blank correct, I don't think it is necessary (or worth the added cost) for the lab to analyze 3 of each type of Reagent Blanks. I think one Reagent Blank for the Water, Acetone, and Methylene Chloride is adequate to see if there is reagent contamination.

page 22 I don't see why Sections 9.10, 9.11, and 9.12 are needed. (Audit Samples) There are no CPM Audit Samples available and I don't think it would be useful to create or require them.

page 32 - Equation 12.2.4 is incorrect. The subscript f (mass collected on the CPM filter) is no longer relevant. The Teflon Filter is not weighed anymore.

FYI,

I had Bruce take a clean Teflon filter (82.6 mm size Teflon filter) and do the water and methylene chloride extractions. He saw about 1 mg of aqueous blank catch and about 0.2 mg of organic blank material.

Thanks for the advance copy. I am looking forward to field testing with this method.

Jim Serne, PE, QSTI
Principal Engineer
TRC Environmental Corporation
5540 Centerview Drive, Suite 100
Raleigh, NC 27606
Voice (919) 256-6231
Cellular (919) 302-2520
Facsimile (919) 838-9661

From: <Myers.Ron@epamail.epa.gov>
To: "Doris Montecastro" <dmontecastro@algcorp.com>
CC: <Tong.Stanley@epamail.epa.gov>, <Frey.Steve@epamail.epa.gov>, <Deweese.Ja...>
Date: 5/9/2008 4:55 PM
Subject: RE: Question about the Dry Impinger Method for Determining CPM from Stationary Sources

Index 2

Doris:

We are developing the method for applicability to all sources. We have gone a long ways to inhibit artifact formation and therefore expect that if the method collects the material then it is PM. At some future time when a method that better replicates particulate formation in the atmosphere becomes widely available, we may have better information upon which to change this assertion.

First, at high stack temperatures (>350F) ammonia is inhibited from chemically reacting with acid gases. If ammonia chemically combines with another reactive acid stack gas (SOx, NO, etc.) due to a reduced temperature (in the stack or when released to the atmosphere) it is considered particulate matter emissions. As an evaluation, we performed a limited number of lab experiments with the addition of ammonia in the presence of SO2, NO and NO2 and did not see any reactions even though we expected there to be a reaction. We will do some more limited experiments as one of the stakeholders experiments with different SO2, SO3 and H2O experiments are concluded.

By the way, an updated version of this method was posted to the EMC web site yesterday. Go to <http://www.epa.gov/ttn/emc/prelim.html> and look at OTM-28.

Ron Myers
 U.S. Environmental Protection Agency
 Office of Air Quality Planning and Standards
 Sector Policy and Programs Division
 Monitoring Policy Group, D243-05
 RTP NC 27711
 Tel. 919.541.5407
 Fax 919.541.1039
 E-mail myers.ron@epa.gov

"Doris
 Montecastro"
 <dmontecastro@algcorp.com>
 To
 Ron Myers/RTP/USEPA/US@EPA
 cc
 05/09/2008 04:34
 PM
 Subject
 RE: Question about the Dry
 Impinger Method for Determining
 CPM from Stationary Sources

Hi Ron,

Thanks for your reply. I was just inquiring from a technical standpoint but it's also good to know that the district may determine whether the method may be used for source testing or not. Another question I have is whether the method is valid for sources that have ammonia slip.

Once again, your input is much appreciated.

Regards,
Doris

Doris Montecastro, Ph.D.
Environmental Engineer
Ashworth Leininger Group
601 Daily Drive, Suite 302
Camarillo, CA 93010
Phone: 805-764-6016
Fax: 805-764-6011

*****NOTICE*****

The information contained in this communication is confidential and privileged proprietary information intended only for the individual or entity to whom it is addressed. Any unauthorized use, distribution, copying or disclosure of this communication is prohibited. If you have received this communication in error, please contact the sender immediately.

From: Myers.Ron@epamail.epa.gov [<mailto:Myers.Ron@epamail.epa.gov>]
Sent: Thursday, May 01, 2008 3:02 PM
To: Doris Montecastro
Cc: Tong.Stanley@epamail.epa.gov
Subject: Re: Question about the Dry Impinger Method for Determining CPM from Stationary Sources

Doris:
We are working on the dry impinger method as an improvement over the existing Method 202 test method for quantifying condensable PM. From a strictly technical standpoint, the dry impinger method would be better than Method 202.

I am not sure exactly where Camarillo CA is and you did not mention where the source is located. You will need to discuss the use of the test method with the regulatory agency responsible for the PSD permit. If you are in the South Coast area, it will be very difficult for you to convince the district to allow you to use the method. They will want you to use the SC Method 5 which prohibits the nitrogen purge of Method 202. I am not familiar with what other districts in California will want you to use. I have copied Stan Tong in Region IX who may be more familiar with the different districts stances on measuring condensable PM.

Ron Myers
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Sector Policy and Programs Division
Monitoring Policy Group, D243-05
RTP NC 27711
Tel. 919.541.5407
Fax 919.541.1039
E-mail myers.ron@epa.gov

-----"Doris Montecastro" <dmontecastro@algcorp.com> wrote: -----
To: Ron Myers/RTP/USEPA/US@EPA
From: "Doris Montecastro" <dmontecastro@algcorp.com>
Date: 05/01/2008 05:30PM
Subject: Question about the Dry Impinger Method for Determining CPM from Stationary Sources
Hi Ron,

I got the Sept. 2007 Draft copy of the Dry Impinger Method for

Determining Condensable Particulate Matter from Stationary Source from the EPA website. Can this method be used for Source Testing a natural gas-fired combustion source for PSD purposes?

Your help is much appreciated.

Sincerely,

Doris Montecastro, PhD
Environmental Engineer
Ashworth Leininger Group
601 Daily Drive, Suite 302
Camarillo, CA 93010
Phone: 805-764-6016
Fax: 805-764-6011

*****NOTICE*****

The information contained in this communication is confidential and privileged proprietary information intended only for the individual or entity to whom it is addressed. Any unauthorized use, distribution, copying or disclosure of this communication is prohibited. If you have received this communication in error, please contact the sender immediately.

From: <Myers.Ron@epamail.epa.gov>
To: Lee Carlson <l_carlson@src-ncasi.org>, Jim Stainfield <j_stainfield@src-...>
CC: <Ray.Merrill@erg.com>, "Joe Fanjoy" <joe.fanjoy@erg.com>, <Deweese.Jason@...>
Date: 5/14/2008 4:17 PM
Subject: Re: Dry Impinger Method

Index 3

Lee:
 Thanks for looking the method over with a fine tooth comb.

The short answer is that the filters must be extracted by sonication with the solvents required in the method. We have not specified the sonic bath or the extraction glassware because any extracting glassware will do as long as the it is clean and will hold the requisite amount of solvent, submerge the filter, and provide a boundary to the extraction vessel can be put in the sonic bath without contaminating the sample. A 50 mL glass tube seemed the most efficient, but a beaker or any other vessel that meets the minimum qualifications above will do. It's got to be glass because that's the standard material for extraction when organic solvents are involved.

If you believe that we need to be more prescriptive, let me know. This will increase the level of detail. But if you have some rationale why this would improve the method precision, let me know and we will consider adding this detail to the method.

Thanks again for looking over the method.

Ron Myers
 U.S. Environmental Protection Agency
 Office of Air Quality Planning and Standards
 Sector Policy and Programs Division
 Monitoring Policy Group, D243-05
 RTP NC 27711
 Tel. 919.541.5407
 Fax 919.541.1039
 E-mail myers.ron@epa.gov

Lee Carlson
 <l_carlson@src-ncasi.org>
 To
 Ron Myers/RTP/USEPA/US@EPA
 05/14/2008 09:21 AM cc
 Jim Stainfield
 <j_stainfield@src-ncasi.org>
 Subject
 Dry Impinger Method

Dear Ron,

I have been reviewing the latest iteration of the 'Dry Impinger Method' (OTM 28) and need some clarification on section 11.2.1.1 regarding extraction of the Teflon membrane filter. It is unclear from the method

what apparatus is to be used for the extraction and there was no description of the extraction apparatus in section 6, 'Equipment and Supplies'. I found suppliers for extraction thimbles which are described based on their dimensions and material of construction, and

typically used with Soxhlet extractors. However, the description of the procedure does not seem to correlate with use of extraction thimbles. Am I to simply use a 50 mL test tube? What materials of construction? Any assistance you can render would be appreciated.

Sincerely,

--

Lee Carlson
Senior Research Associate
NCASI Southern Regional Center
402 SW 140th Terrace
Newberry, FL, 32669
352-331-1745 ext 259
Fax: 352-331-1766

From: <Myers.Ron@epamail.epa.gov>
To: Lee Carlson <l_carlson@src-ncasi.org>
Date: 5/27/2008 3:47 PM
Subject: Re: OTM-27 errors

Index 4a

Lee:
Thanks for the review. As I collect other (I hope few) comments on the methods, I will revise the methods and re-post the updated versions on the OTM web site. I am hoping that this additional level of vetting of the methods will mean that I only have to correct the errors incurred by the typesetter when the methods have gone through the proposal and promulgation phase for publication in the Federal Register.

Ron Myers
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Sector Policy and Programs Division
Monitoring Policy Group, D243-05
RTP NC 27711
Tel. 919.541.5407
Fax 919.541.1039
E-mail myers.ron@epa.gov

Lee Carlson
<l_carlson@src-ncasi.org>
To
Ron Myers/RTP/USEPA/US@EPA
05/27/2008 01:44 PM
cc
Subject
OTM-27 errors

Ron,

Just two more minor errors I noted in OTM-27. In equation No. 42 on page 57 the term for the density of acetone appears in subscript font and should be in full size font to prevent confusion. Also, in equation No. 43 on the same page the subscript denoting concentration for total filterable particulate is reversed. It reads Cft instead of Ctf as listed in the definition of variables section.

--
Lee Carlson
Senior Research Associate
NCASI Southern Regional Center
402 SW 140th Terrace
Newberry, FL, 32669
352-331-1745 ext 259
Fax: 352-331-1766

From: <Myers.Ron@epamail.epa.gov>
To: <Ray.Merrill@erg.com>, "Joe Fanjoy" <joe.fanjoy@erg.com>, "Danny Greene" ...
Date: 5/27/2008 4:07 PM
Subject: Fw: Error in OTM-27 Equation No. 9

Index 4b

Ron Myers
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Sector Policy and Programs Division
Monitoring Policy Group, D243-05
RTP NC 27711
Tel. 919.541.5407
Fax 919.541.1039
E-mail myers.ron@epa.gov

----- Forwarded by Ron Myers/RTP/USEPA/US on 05/27/2008 04:03 PM -----

Lee Carlson
<l_carlson@src-n
casi.org>
To
Ron Myers/RTP/USEPA/US@EPA
05/27/2008 12:56 PM cc
"Ashok Jain (SRC)"
<AJain@src-ncasi.org>
Subject
Error in OTM-27 Equation No. 9

Ron,

I've been reviewing OTM-27 (formerly CTM-040, formerly PRE-4) and have found a misprint in the current version. In OTM-27, equation No. 9 on page 51 the term for barometric pressure has been left out of the denominator in the right most term of the equation. I'll forward any other discrepancies should I find any.

Sincerely,

--
Lee Carlson
Senior Research Associate
NCASI Southern Regional Center
402 SW 140th Terrace
Newberry, FL, 32669
352-331-1745 ext 259
Fax: 352-331-1766

From: "Serne, Jim (Raleigh,NC-US)" <JSerne@TRCSOLUTIONS.com>
To: <Myers.Ron@epamail.epa.gov>, "Owens, Roy" <roy.owens@owenscorning.com>
CC: "Duncan, Charles III (GE Infra, Energy)" <charles1.duncan@ge.com>, <Ray....>
Date: 5/27/2008 7:52 PM
Subject: RE: Dry Impinger Method

Index 5

Ron, Roy et al,

We used 83 mm Teflon membrane filters on Teflon supports. We pulled about 200 cf of sample at 4% moisture and had no pressure problems. We kept the CPM Filter temp between 80 to 84 F.

Jim

-----Original Message-----

From: Myers.Ron@epamail.epa.gov [mailto:Myers.Ron@epamail.epa.gov]
Sent: Tuesday, May 27, 2008 3:56 PM
To: Owens, Roy
Cc: Duncan, Charles III (GE Infra, Energy); Ray.Merrill@erg.com; Joe Fanjoy; Serne, Jim (Raleigh,NC-US)
Subject: RE: Dry Impinger Method

Roy:

Thanks for the feedback. I talked to Jim Serne about his experience with using Teflon membranes and he stated that he has not had any problems. I did not ask him what size filters he was using (I believe that they may be 4" rather than 47mm) and what type of filter support he was using. EPRI will be performing some additional lab experiments with the Teflon membrane filters and we should have some baseline and H2SO4 loaded samples to compare to what you and Jim have experienced.

 Ron Myers U.S. Environmental Protection Agency Office of Air Quality Planning and Standards Sector Policy and Programs Division Monitoring Policy Group, D243-05 RTP NC 27711 Tel. 919.541.5407 Fax 919.541.1039 E-mail myers.ron@epa.gov

"Owens, Roy"
 <roy.owens@owens
 corning.com>
 To
 Ron Myers/RTP/USEPA/US@EPA
 05/27/2008 01:23 cc
 PM "Duncan, Charles III (GE Infra,
 Energy)" <charles1.duncan@ge.com>
 Subject
 RE: Dry Impinger Method

Ron,

This is an update on the testing we did using the latest dry impinger method. We were also doing OTM 27. We were only using the PM2.5 head.

As we discussed we were using a 47 mm filter for the CPM filter. We were unable to achieve a flow rate anywhere close to the rate required for isokinetic sampling. This was with 28 inches of vacuum. One of the solutions we had was to put a glass/quartz fiber filter as a backing. This worked at first. However, the flow rate dropped off rapidly. It was assumed that due to the loading of fine particulate that the holes were

becoming plugged. The source contains no organic emissions. It was decided to switch to a quartz fiber filter for the CPM filter in order to complete the testing.

The filter holder that we used had 60 holes in the filter support. We measured the size of the holes and I calculated the area that was available for air to pass through. The total area of the 60 holes was about 9.1% of the total 47 mm filter. Initially, the O ring we used was so large that it covered all but 26 holes. This meant that at first we only had 4.1% of the area of a 47 mm filter available for air flow.

Chuck Duncan and I discussed possible solutions to the problem: '

1. Use a filter holder with a sinter glass support.
2. Use a larger teflon filter holder (at least 90 mm) and use a glass or quartz fiber filter as a backing.
3. Use a filter holder that has a teflon coated wire mesh screen as a backing. If this option is available you would probably have to use a glass or quartz fiber filter for support.

Roy Owens
740-321-6863

The information contained in this communication and its attachment(s) is intended only for the use of the individual to whom it is addressed and may contain information that is privileged, confidential, or exempt from disclosure. If the reader of this message is not the intended recipient,

you are hereby notified that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, please notify postmaster@owenscorning.com and delete the communication without retaining any copies. Thank you.

Translations available: <http://www.owenscorning.com/emailfooter.html>

From: Ray Merrill
To: MacNeal, James; Myers.Ron@epamail.epa.gov
CC: Fanjoy, Joe; Merrill, Ray
Date: 6/11/2008 3:56 PM
Subject: Re: questions

Index 6

Jim

I'm reviewing comments from Stakeholders and interested parties while we help Ron prepare the final version of the CPM method.

Here are some thoughts for you to consider:

Typical sampling rates are 14 to 28 L/min per minute. EPA is requiring purge for 1 hour at the approximate sampling rate used while the sample was collected. So by my calculation that means the estimated maximum volume of the nitrogen used in the purge would be about 1680 L, not counting use or loss during the setup.

You can figure how much nitrogen you want left in the cylinder at the end of the purge and the associated total volume of gas needed for a purge. We've been using UHP compressed nitrogen in large lab size cylinders so we've always had an excess, and we don't take cylinders below a 250 psig pressure.

Regarding the filter for the purge gas - The filter should be selected or treated so it collects any fine particulate that might originate from the cylinder, regulatory, or connecting tubing and the filter should not contribute any mass to the gas stream (e.g., glass shards, metal fragments etc.) A good assumption is that it should be as efficient as filters specified in Method 5. My preference is a 47 mm Teflon filter, but you may have others in mind that meet the intent.

Ray

Raymond G. Merrill Ph.D.
Eastern Research Group
Principal Scientist
Senior Program Manager
601 Keystone Park Dr Ste 700
Morrisville, NC 27560
Phone 919 468 7887
FAX 919 468 7803

The information contained in this communication and its attachment(s) is intended only for the use of the individual to whom it is addressed and may contain information that is privileged, confidential, or exempt from disclosure. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, please notify ray.merrill@erg.com and delete the communication without retaining any copies.

>>> <Myers.Ron@epamail.epa.gov> 5/29/2008 8:14 AM >>>

Jim:

As you may notice in paragraph 8.5.3.3 and in Figure 2 of OTM28 (which will be proposed to replace the existing Method 202), there is a filter between the regulator and the first rotameter. We do not specify the pore size or efficiency of the filter but it is to remove any solid material that may be in the nitrogen or the lines of the delivery system so the tester is not adding mass to the material collected during the sampling event. It is our belief that most testers would use a filter that meets the specification of Method 5. That is 99.5% efficient for 0.2 uM DOP particulate.

Also we specify in paragraph 7.1.5 the use of Ultra-High Purity nitrogen. It is my understanding that there is no consistent standard across vendors on how one determines the nitrogen to achieve this specification. The important parameters for use with Method 202 and OTM 28 are that there not be a measurable mass of organic material or inorganic material that would be retained in the collected water or on the CPM back up filter. For organic compounds this could probably be limited to MeCl soluble organic compounds with molecular weight more than about 10 or that would be absorbed in water and combine with gasses and other organic compounds that were collected in the water. For inorganic vapors and gases this might include compounds like ammonium

nitrate, ammonium sulfate etc. and even ammonia gas.

The reason that we are specifying the UHP nitrogen and a filter is that several test contractors have tracked down some of their high results to contaminated nitrogen delivered to them from gas suppliers. They have also reported high blanks in the reagents they have used. These situations have provided us support for including the procedure to verify the residue content of the reagents both prior to taking the reagent into the field and for collecting field blank of the reagents and then performing a field run blank. We believe that having this information may help a tester explain high values during a sampling event if it is due to poor reagents or gas.

Given the minimum requirements of the method, I would expect that a four cylinders of 1,700 liters would be acceptable. Or if a single cylinder suitable for three sampling runs plus a field blank would have the capability of delivering 5,500 liters would be desired.

I have copied this message to Ray Merrill should he have any additional thoughts or comments.

Ron Myers
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Sector Policy and Programs Division
Monitoring Policy Group, D243-05
RTP NC 27711
Tel. 919.541.5407
Fax 919.541.1039
E-mail myers.ron@epa.gov

"James MacNeal"

To
Ron Myers/RTP/USEPA/US@EPA
05/28/2008 05:08 PM cc
Subject
questions

Mr. Myers,

I have a few questions regarding the use of N2 as a purge agent in method 202, OTM 27 and OTM 28.

1. Quantity of N2 required for purging per procedure; 20 lpm for 60 minutes = 1200 liters?
2. Is a filter required for the N2 and if so what mesh?
3. Is there any other requirement for N2, other than the main purge as described above and if so what quantity per procedure is required?

Again, I hope you can help me in this.

Best Regards,
Jim

James R. MacNeal

From: <Myers.Ron@epamail.epa.gov>
To: "J. Bruce Nemet" <Resolute1@charterinternet.com>
CC: "Ray Merrill" <Ray.Merrill@erg.com>, "Joe Fanjoy" <Joe.Fanjoy@erg.com>, ...
Date: 6/18/2008 3:40 PM
Subject: Re: OTM 028 CPM Filters
Attachments: labfilters_pall_com_catalog_924_20061.pdf

Index 7

Bruce:

Ray gave me the option of using the individual solvent blanks or the field blank to correct for the residue in the solvents. Since the field blank uses solvents that (hopefully) have been handled the same as the solvents used for analysis of the actual runs and provides the tester with the potential to get reasonable data when one solvent is a little high but the others are lower and make up the difference (or some anyway), I selected using the field blank to get the combined residue for recovering, extracting and processing the test samples. The individual blanks of the solvents will assist the source tester or lab technician to problem solve a field blank that exceeds the allowable blank subtraction. It also provides the tester a better idea of where they need to improve their technique.

Ron Myers
 U.S. Environmental Protection Agency
 Office of Air Quality Planning and Standards
 Sector Policy and Programs Division
 Monitoring Policy Group, D243-05
 RTP NC 27711
 Tel. 919.541.5407
 Fax 919.541.1039
 E-mail myers.ron@epa.gov

"Ray Merrill"
 <Ray.Merrill@erg.com>
 .com> To
 "J. Bruce Nemet"
 06/18/2008 01:55 PM <Resolute1@charterinternet.com>
 PM cc
 "Joe Fanjoy"
 <Joe.Fanjoy@erg.com>, "Ray
 Merrill" <Ray.Merrill@erg.com>
 Subject
 Re: OTM 028 CPM Filters

Bruce

It's important that the Teflon filter have the proper filter holder support. A flat Teflon disk with holes drilled in it will not let sufficient gas through. Our Teflon holders have concentric grooves that permit gas to be drawn through a larger area on the filters once pump vacuum is applied.

The reason for the Teflon filter is to avoid filter chards contributing to the mass of the CPM, so clearly fiberglass, quarts, or Teflon coated glass fiber filters that throw off chards when the filters are sonicated will bias the CPM results high.

The filter specification for OTM 028 CPM nominally requires the same collection efficiency as Method 5. We have found that the 47 mm ambient

air filter meets these specifications. We've also found a filter supplied by Pall that meets the ASTM DOP retention criteria. I've attached a pdf from the Pall web site. The Zefluor Membrane seems to be acceptable even at the 3 um pore specification. Pall only offers a 1 um in the 90 mm Zefluor and we have that one on order to evaluate.

We've done some preliminary pressure drop experiments with our setup consisting of a Method 5 front half and an OTM 28 back half. The 47 mm filter has a significant pressure drop and in our hands will work at 0.5 cfm but not much higher. (pressure drop, inches of Hg 4 at 0.5 cfm, 8 at 0.75 cfm and 16 at 1cfm)

We have a 4 inch Teflon membrane filter that provides better flow, obviously. These filters were cut from an 8/10 sheet so we had to be careful to remove cutting debris from the edges. The 4 inch Teflon discs showed a dry pressure drop at 1 cfm of about 9 inches of Hg.(pressure drop, inches of Hg. 2.5 at 0.5 cfm, 5.0 at 0.75 cfm, 9.0 at 1 cfm)

Hope this helps
Ray

Raymond G. Merrill Ph.D.
Eastern Research Group
Principal Scientist
Senior Program Manager
601 Keystone Park Dr Ste 700
Morrisville, NC 27560
Phone 919 468 7887
FAX 919 468 7803

The information contained in this communication and its attachment(s) is intended only for the use of the individual to whom it is addressed and may contain information that is privileged, confidential, or exempt from disclosure. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, please notify ray.merrill@erg.com and delete the communication without retaining any copies.

>>> "J. Bruce Nemet" <Resolute1@charterinternet.com> 6/18/2008 11:42 AM
>>>
Pie Charts

Ray,

I am attempting to locate back 1/2 CPM filters for OTM-028, aka "Dry Impinger 202" procedure. I have found three different teflon filters — one is a teflon-coated quartz filter which seems to shed 1-1.5 mgs of filter material during the filter extraction process; another is a teflon membrane filter which obviously produces a significant pressure drop during sampling; and the third is a true teflon filter which seems to work well but is pricey and has a long lead time (They're produced and distributed in Japan.)

Have you located any filters that work well with this method and/or have you determined any particular type or manufacturer that is more suitable than the others?

Incidentally, we have thus far performed several of these methods in-house and they work reasonably well (with low sulfate artifact) although the water fractions take a considerable amount of time to go dry at the 85 F temp. Also, I have been subtracting the individual

fractions (organic vs inorganic field blank PM) from their corresponding sample fractions. The method states that a total CPM Field Blank mass is to be subtracted from each total sample CPM mass but this doesn't make any sense to me. Any thoughts?

Thanks.

J. Bruce Nemet
QA Officer
Resolution Analytics, Inc.
2733 Lee Avenue
Sanford, NC 27332
Phone (919) 774-5557
Fax (919) 776-6785
Resolute@resolutionanalytics.com

(See attached file: labfilters_pall_com_catalog_924_20061.pdf)



Pall Corporation

[Home](#) | [Products](#) | [Contact Us](#) | [Search](#)

Laboratory

Market/Applications

Products

Literature Library

Support

Events

Shopping Cart

0 items

- Lab Store
- Check Out
- Quick Order
- My Account

PTFE Membrane Disc Filters

Description
Applications
Specifications
Ordering Information

Strong, chemically resistant membranes for air monitoring and sampling in aggressive environments

- | Low chemical background permits highly sensitive, interference-free determinations.
- | Ensures accurate gravimetric determinations with low tare mass.
- | Zelfluor™ membrane now available in 0.5 µm pore size to meet NIOSH specifications.
- | Ideal for filtration of gas and/or organic solvents.

[Order Online Now](#)



Ultra Vial

Pall Preferred

 Print

 Email

 Download PDF



Your shopping cart is empty.

*US List Price applies only to products delivered within the US. These prices do not reflect duties, taxes or tariffs, which may apply to purchases made outside of the US. See our [General Limited Warranty](#).


Pall Corporation

[Home](#) | [Products](#) | [Contact Us](#) | [Search](#)

Laboratory
Market/Applications
Products
Literature Library
Support

Events

Shopping Cart
0 items

[Order Online Now](#)


PTFE Membrane Disc Filters

Description

Applications

Specifications

Ordering Information

- | For air monitoring and sampling in aggressive environments.
- | Supported membranes offer increased durability for hostile testing environments or acid aerosol monitoring.
- | Teflo membrane offers unique PMP support ring for PM 10 and PM 2.5 dichotomous and other air sampling techniques.
- | Ultimate in chemical compatibility for filtering harsh chemicals and HPLC mobile phases that destroy other membrane materials.

Filter View

Pall Preferred


Print


Email


Download PDF

Your shopping cart is empty.

*US List Price applies only to products delivered within the US. These prices do not reflect duties, taxes or tariffs, which may apply to purchases made outside of the US. See our [General Limited Warranty](#).

PALL Pall Corporation

[Home](#)
[Products](#)
[Contact Us](#)
[Search](#)

[Laboratory](#)
[Market/Applications](#)
[Products](#)
[Literature Library](#)
[Support](#)

[Events](#)

Shopping Cart
0 items

[Lab Store](#)
[Check Out](#)
[Quick Order](#)
[My Account](#)

PTFE Membrane Disc Filters

[Order Online Now](#)

[Description](#)
[Applications](#)
[Specifications](#)
[Ordering Information](#)

Description	Zefluor™ Membrane	Teflo Membrane
Filter Media/Support	PTFE with PTFE support	PTFE with PMP (polymethylpentene) support ring
Typical Thickness	0.5 µm: 178 µm (7 mils) 1 µm: 165 µm (6.5 mils) 2 and 3 µm: 152 µm (6 mils)	1 µm: 76 µm (3 mils) 2 µm: 46 µm (1.8 mils) 3 µm: 30.4 µm (1.2 mils)
Typical Air Flow Rate (L/min/cm ² at 0.7 bar (70 kPa, 10 psi))	0.5 µm: 1 1 µm: 14.6 2 µm: 25.3 3 µm: 53	1 µm: 17 2 µm: 53 3 µm: 90
Minimum Bubble Point - IPA bar (psi)	Not Applicable	Not Applicable
Water Breakthrough bar (psi)	Not Applicable	Not Applicable
Typical Aerosol Retention*	0.5, 1, and 2 µm: 99.99% 3 µm: 99.98%	1 and 2 µm: 99.99% 3 µm: 99.79%

Description	Zylon™ Membrane	TF (PTFE) Membrane
Filter Media/Support	Unsupported PTFE	PTFE on a polypropylene support
Typical Thickness	140 µm (5.5 mils)	0.2 µm: 139 µm (5.5 mils) 0.45 and 1 µm: 135 µm (5.3 mils)
Typical Air Flow Rate (L/min/cm ² at 0.7 bar (70 kPa, 10 psi))	5 µm: 13	0.2 µm: 2 0.45 µm: 3 1 µm: 7
Minimum Bubble Point - IPA bar (psi)	Not Applicable	0.2 µm: 1.0 (15) 0.45 µm: 0.4 (6) 1 µm: 0.1 (2)
Water Breakthrough bar (psi)	Not Applicable	0.2 µm: 2.8 (40) 0.45 µm: 1.1 (16) 1 µm: 1.0 (15)
Typical Aerosol Retention*	Not Applicable	Not Applicable

*Following ASTM D 2986-95A 0.3 µm (DOP) at 32 L/min/100 cm² filter media.

Your shopping cart is empty.

*US List Price applies only to products delivered within the US. These prices do not reflect duties, taxes or tariffs, which may apply to purchases made outside of the US. See our [General Limited Warranty](#).



Pall Corporation

[Home](#) | [Products](#) | [Contact Us](#) | [Search](#)

Laboratory

Market/Applications

Products

Literature Library

Support

Events

Shopping Cart

0 items

Lab Store

Check Out

Quick Order

My Account

PTFE Membrane Disc Filters

Description
Applications
Specifications
Ordering Information

Part Number	Description	Pkg	Price	Qty
Zefluor™ Membrane				
P5PQ025	0.5 µm, 25 mm	100/pkg	279.19	<input type="text" value="0"/>
P5PQ047	0.5 µm, 47 mm	50/pkg	185.38	<input type="text" value="0"/>
P5PL025	1 µm, 25 mm	100/pkg	258.69	<input type="text" value="0"/>
P5PL037	1 µm, 37 mm with support pads	50/pkg	147.41	<input type="text" value="0"/>
P5PL047	1 µm, 47 mm	50/pkg	171.98	<input type="text" value="0"/>
P5PL090	1 µm, 90 mm	50/pkg	618.68	<input type="text" value="0"/>
P5PL001	1 µm, 8 x 10 in.	25/pkg	1,089.95	<input type="text" value="0"/>
60048	2 µm, 25 mm	100/pkg	261.63	<input type="text" value="0"/>
P5PJ037	2 µm, 37 mm, with support pads	50/pkg	148.53	<input type="text" value="0"/>
P5PJ047	2 µm, 47 mm	50/pkg	171.98	<input type="text" value="0"/>
P5PJ001	2 µm, 8 x 10 in.	25/pkg	1,115.67	<input type="text" value="0"/>
P5PI001	3 µm, 8 x 10 in.	25/pkg	1,094.42	<input type="text" value="0"/>
Teflo Membrane				
R2PL037	1 µm, 37 mm	50/pkg	290.36	<input type="text" value="0"/>
R2PL047	1 µm, 47 mm	50/pkg	313.80	<input type="text" value="0"/>
R2PJ037	2 µm, 37 mm	50/pkg	290.36	<input type="text" value="0"/>
R2PJ041	2 µm, 41 mm	50/pkg	303.76	<input type="text" value="0"/>
R2PJ047	2 µm, 47 mm	50/pkg	313.80	<input type="text" value="0"/>
R2PI025	3 µm, 25 mm	50/pkg	287.01	<input type="text" value="0"/>
60146	3 µm, 47 mm	50/pkg	315.55	<input type="text" value="0"/>
Zylon™ Membrane				
P4PH037	5 µm, 37 mm, with support pads	50/pkg	155.23	<input type="text" value="0"/>
P4PH047	5 µm, 47 mm	50/pkg	170.86	<input type="text" value="0"/>
TF (PTFE) Membrane				
66141	TF 200, 0.2 µm, 13 mm	100/pkg	175.07	<input type="text" value="0"/>
66142	TF 200, 0.2 µm, 25 mm	100/pkg	233.42	<input type="text" value="0"/>
66143	TF 200, 0.2 µm, 47 mm	100/pkg	306.36	<input type="text" value="0"/>
66630	TF 200, 0.2 µm, 50 mm	100/pkg	325.44	<input type="text" value="0"/>
66145	TF 200, 0.2 µm, 142 mm	25/pkg	341.68	<input type="text" value="0"/>

Order Online Now

Print

Email

Download PDF

66146	TF 200, 0.2 μ m, 293 mm	25/pkg	1,109.30	<input type="text" value="0"/>
66147	TF 450, 0.45 μ m, 13 mm	100/pkg	175.07	<input type="text" value="0"/>
66148	TF 450, 0.45 μ m, 25 mm	100/pkg	233.42	<input type="text" value="0"/>
66149	TF 450, 0.45 μ m, 47 mm	100/pkg	306.36	<input type="text" value="0"/>
66631	TF 450, 0.45 μ m, 50 mm	100/pkg	325.44	<input type="text" value="0"/>
66151	TF 450, 0.45 μ m, 142 mm	25/pkg	341.68	<input type="text" value="0"/>
66152	TF 450, 0.45 μ m, 293 mm	25/pkg	1,109.30	<input type="text" value="0"/>
66153	TF 1000, 1 μ m, 13 mm	100/pkg	175.07	<input type="text" value="0"/>
66154	TF 1000, 1 μ m, 25 mm	100/pkg	233.42	<input type="text" value="0"/>
66159	TF 1000, 1 μ m, 37 mm, with support pads	100/pkg	307.10	<input type="text" value="0"/>
66155	TF 1000, 1 μ m, 47 mm	100/pkg	306.36	<input type="text" value="0"/>
66158	TF 1000, 1 μ m, 293 mm	25/pkg	1,076.98	<input type="text" value="0"/>

Add items to order

Contact Customer Service at 800-521-1520 for possible lead-time and date item will be available to ship.

Your shopping cart is empty.

*US List Price applies only to products delivered within the US. These prices do not reflect duties, taxes or tariffs, which may apply to purchases made outside of the US. See our [General Limited Warranty](#).

Ray Merrill - Re: Comment on Method 202

From: <Myers.Ron@epamail.epa.gov>
To: "Barney, Charles" <cbarney@grda.com>
Date: 6/25/2008 8:36 PM
Subject: Re: Comment on Method 202
CC: <Ray.Merrill@erg.com>, <Deweese.Jason@epamail.epa.gov>, <Sorrell.Candace@epamail.epa.gov>
Attachments: Methd202 Comment.pdf

Index 8

Barney:

I will add you to the list of stakeholders for the Method 202 improvement effort.

With respect to the measurement situation that you experienced with the use of Method 202 as promulgated in the Federal Register, you will notice in the text describing what EPA is doing to improve Method 202 that:

- 1) EPA Method 202 as promulgated could have a sulfate artifact of up to 250 mg if the nitrogen purge was omitted (an allowed option under specified conditions),
- 2) The artifact level could be reduced to about 10 to 15 mg with the use of the nitrogen purge,
- 3) The method has the potential for producing highly variable results due to the numerous options in the method as promulgated,
- 4) Through some minor modifications of the glassware, sample collection procedures and sample analysis procedures combined with using a single set of sampling and analysis procedures, the sulfate artifact is reduced to the demonstrated detection limit of the method (1 to 2 mg) and the precision is improved.
- 5) Some notable stakeholders that are active participants of the project include the Electric Power Research Institute, National Council for Air and Stream Improvement (pulp and paper industry), American Petroleum Institute, Portland Cement Association, Utility Air Resource Group, Automotive Alliance, National Association of Clean Air Agencies (State and local Air Agencies) and Environment Canada.
- 6) We have posted the dry impinger test method to the "Other Test Methods" web page and the Agency will work with stakeholders to encourage the use of this improved test method.

The next time you test your boilers, request that the State allow you to use OTM 28 (unless we have promulgated a replacement for Method 202). In addition, you would be well served to use a good test contractor that takes care to use clean glassware and follows good sampling techniques to reduce contamination of the sample. At very low particulate concentrations as you may have, eliminating potential contamination from poor technique is imperative.

Also, you may also encourage the test contractor and the State to accept the use of EPA's electronic source test application rather than paper reports. This product will simplify and standardize the planning, conduct and review of the test program. In addition, EPA can more easily use the data to improve the available emissions factor available to people. You can review the capabilities of the Electronic Reporting Tool at http://www.epa.gov/ttn/chief/ert/ert_tool.html.

Ron Myers
 U.S. Environmental Protection Agency
 Office of Air Quality Planning and Standards
 Sector Policy and Programs Division
 Monitoring Policy Group, D243-05
 RTP NC 27711
 Tel. 919.541.5407
 Fax 919.541.1039
 E-mail myers.ron@epa.gov

-----"Barney, Charles" <cbarney@grda.com> wrote: -----

To: Ron Myers/RTP/USEPA/US@EPA
From: "Barney, Charles" <cbarney@grda.com>
Date: 06/25/2008 05:29PM
Subject: Comment on Method 202

<<Methd202 Comment.pdf>>
Mr. Ron Myers:

Attached is comment on Method 202, sent to you as suggested on the EPA website.

Charles J. Barney, P.E.
Assistant General Manager
Grand River Dam Authority
P.O. Box 609
Chouteau, Oklahoma 74337
918-824-1074 (ext. 5517)
cbarney@grda.com



June 25, 2008

Mr. Ron Myers
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Sector Policy and Programs Division
Monitoring Policy Group, D243-05
RTP NC 27711

Subject: Inaccuracy of EPA Method 202
Attached EPA Request for Comment by June 27, 2008

Dear Mr. Myers:

First of all, please add my email (cbarney@grda.com) to your listing of Stakeholders interested in efforts to improve EPA Test Method 202 for Condensable Particulate.

As you are aware, Method 202 is prone to falsely high error due to SO2 contamination of impinger water, particularly when measuring emissions from coal fired boilers. EPA's efforts to develop an improved method are obviously necessary considering plans to regulate emissions of PM 2.5.

The primary purpose of this letter is to comment on the severe consequences of a falsely high condensable particulate measurement when using Method 202. Our utility operates a coal fired boiler equipped with a dry SO2 scrubber, which is very effective at scrubbing out condensable acid gases. While many similar boilers are permitted at a maximum rate of 0.1#/MBtu particulate, our unit is permitted at a much stricter maximum of 0.028#/MBtu. Thus, false high results with Method 202 can more easily affect our compliance status.

A few years ago, our utility voluntarily ran a battery of stack tests. Imagine our consternation when this scrubbed unit failed to meet its .028 particulate standard. The unit was shut down and thoroughly inspected, but no deficiencies of significance were found. Upon retesting, the unit met the standard. Much later analysis of these tests determined the initial stack test failure was due to falsely high Method 202 results, with the second test much lower, likely due to faster implementation of nitrogen purge.



- ADMINISTRATION • PO Box 409 • Vinita OK 74301-0409 • 918-256-5545 • Fax 918-256-5289
COAL-FIRED COMPLEX • PO Box 609 • Chouteau OK 74337 • 918-824-1071 • Fax 918-825-7791
CUSHING FIELD OFFICE • PO Box 329 • Cushing OK 74023 • 918-225-1507
ENERGY CONTROL CENTER • PO Box 772 • Locust Grove OK 74352 • 918-479-5249 • Fax 918-825-1935
ENVIRONMENTAL • PO Box 220 • Chouteau OK 74337 • 918-824-1034 • Fax 918-824-2049
LAKE PATROL • PO Box 70 • Langley OK 74350 • 918-782-9594 • 918-782-4723 Fax
OFFICE OF ECOSYSTEMS MANAGEMENT • PO Box 70 • Langley OK 74350 • 918-782-3382
OKLAHOMA CITY • PO Box 2605 • Oklahoma City OK 73101-2605 • 405-297-9963 • Fax 405-290-7631
PENSACOLA DAM • PO Box 70 • Langley OK 74350 • 918-782-3382 also Fax
SAFETY • PO Box 10 • Chouteau OK 74337 • 918-824-1034 • Fax 918-824-2049
SALINA PUMPED STORAGE PROJECT • PO Box 609 • Salina OK 74365 • 918-434-5920 also Fax
TRANSMISSION/ENGINEERING • PO Box 1128 • Pryor OK 74362 • 918-825-0280 • Fax 918-825-9416

The Grand River Dam Authority is an agency of the state of Oklahoma, fully supported by customers revenues instead of taxes.

Mr. Ron Myers
June 25, 2008
Page Two of Two

Our review available of technical evaluations of Method 202 leads us to conclude it is inaccurate for testing of coal fired boilers. This issue will become even more important as utilities such as ours are faced with obtaining guaranteed performance for hugely expensive emission control equipment. An accurate and consistent test method is essential. The Method 202 is fatally flawed for use with coal fired boilers, and the proposed improvements to date appear to be inadequate solutions.

Sincerely,



Charles J. Barney, P.E.
Assistant General Manager
Thermal Generation

CJB:cn/4820
Attachment

What is EPA doing to assess and reduce artifact formation in Method 202?

EPA has performed at least two studies to assess artifact formation, is continuing some limited assessments, and is exploring improvements to Method 202. The paper, "Laboratory and Field Evaluation of the EPA Method 5 Impinger Catch for Measuring Condensable Matter from Stationary Sources" ([Method 5 Paper](#)) is a summary report of the results of this early study and was presented at an AWMA specialty conference. The second study was performed in 2005 by Battelle. The report, "Laboratory Evaluation of Method 202 to Determine Fate of SO₂ in Impinger Water" ([Battelle Paper](#)) replicates some of the earlier work and addresses some additional areas. EPA was encouraged by a proposed minor modification to the glassware and beginning conditions of Method 202 that were presented in the proceedings of a November 2005 AWMA specialty conference. The paper, "Optimized Method 202 Sampling Train to Minimize the Biases Associated with Method 202 Measurement of Condensable Particulate Matter Emissions" ([Minimizing Bias Paper](#)) by Richards, Holder and Goshaw presents some background and results that were obtained using this minor modification. In July 2006 EPA obtained resources to investigate in more detail artifact formation in Method 202 and to explore improvements that may further reduce the artifacts. EPA engaged several industrial and State agency stakeholders to comment on EPA's laboratory test plan and to expand on the laboratory evaluations to address gas matrix conditions that were overlooked or other conditions that they believe should be addressed. On August 1, 2006, EPA held a workshop in Research Triangle Park, North Carolina, to present to the stakeholders the Agency plan for evaluating Method 202 and potential modifications that would reduce artifact formation. At the workshop, stakeholders made suggestions for improving and expanding the plan. In addition, several stakeholders volunteered to use the final protocols to conduct laboratory evaluations that replicated some of the Agency evaluations, as well as extending the evaluations to address other gas matrices that were of interest to them. The Agency will combine the data from its own evaluations and the stakeholders' laboratory experiments to evaluate the artifact formation associated with Method 202 and the modified methods. The EPA is also making the invitation request and the minutes of the workshop ([Invitation and Minutes](#)) available to keep interested parties informed of the ongoing activities to improve Method 202. The Agency is also soliciting additional stakeholders that would like to join the effort by following the protocol, replicating evaluations, expanding the matrices being evaluated, and sharing results with all stakeholders. If you are an interested stakeholder, contact Ron Myers at myers.ron@epa.gov.

On September 27, 2006, Ron Myers e-mailed all of the stakeholders update information on the progress of the project. Included in this [email](#) were the results of EPA's laboratory results of the comparative sulfate analyses of the EPA Method 202 and the Dry Impinger Method. Also included in the e-mail were preliminary results provided by Jorge Marson of Environment Canada. Jorge provided data on dry impinger laboratory experiments and some additional issues related to obtaining consistent weighing results.

On November 9, 2006, Ron Myers e-mailed all of the stakeholders the approved Quality Assurance Project Plan (QAPP) for the laboratory assessment of the proposed method for quantifying condensable particulate matter. The [e-mail transmitting the QAPP](#) to the stakeholders requested comments on the plan and requested that stakeholders who were interested in supplementing the EPA assessment submit their plans using a template that was included in EPA's QAPP document. The QAPP that was attached to the e-mail is available through this [link](#).

On January 18, 2007, a meeting of several experienced stack testing individuals and two local equipment vendors was held to discuss hardware issues associated with modifications of the sampling equipment and the glassware for the proposed condensable particulate matter test method. Minutes of the meeting are provided [here](#).

On January 5, 2007, Ron Myers e-mailed all of the stakeholders an [announcement](#) of a February 9, 2007 workshop to discuss our progress, the results of our laboratory study, and commitments to extend the investigation by stakeholders external to EPA. On February 8, 2007, all of the stakeholders were e-mailed a [list](#) of individuals that had indicated that they would attend the workshop or participate by phone. Attached to the e-mail was the preliminary agenda and presentations by EPA and several stakeholders. Minutes of the workshop were drafted and circulated to individuals that made

presentations or made comments during the workshop. The revised minutes and the final presentation materials used at the workshop are available [here](#).

EPA has made an earlier draft version of the dry impinger test method available to stakeholders with the understanding that all parties (the owner of the source, the source test contractor and the regulatory authority) understood that it was a work in progress and agreed to its use. These stakeholders have provided feedback to EPA on the performance of the method, and EPA has assisted the stakeholders in resolving unexpected results. EPA has compiled stakeholder comments and recommendations, submitted up to April 17, 2007, on procedures that the stakeholders believe would improve the precision of condensable particulate matter source testing. In response to the comments and recommendations, EPA analyzed and recorded both the comments and evaluations in [this document](#).

In addition, the Alliance of Automotive Manufacturers (Alliance), a stakeholder in the study to improve the condensable particulate matter test method, conducted field testing to compare EPA Method 202 to the improved dry impinger test method. The stationary source chosen by the Alliance for comparison evaluation was a wet machining operation associated with an oil mist collector control device that serves an automotive machining process for transmission components. The source's flue gas temperature was less than or equal to 85F. The study, conducted on March 29th and 30th, 2007, consisted of simultaneous testing of condensable particulates with Method 202 and with the dry impinger method evaluated by EPA in laboratory studies. One of the Alliance's conclusions is that there is no significant statistical difference between the improved method and traditional Method 202. The report submitted to EPA on 7-26-2007 is available [here](#).

Concurrent with these stakeholder efforts, EPA has revised the dry impinger test method to improve and, where needed, to clarify the required procedures. The revised dry impinger test method is available [here](#) for continued use by stakeholders as long as all parties understand that this method is a work in progress and agree to its use. EPA is making this version available to the entire stakeholder community for review and comment prior to posting this method to the "Other Test Methods" web page. We would appreciate any recommendations that stakeholders believe would make the method more precise and more consistent with quantifying primary particulate matter emissions (that is, those emissions formed near the stack exit as a result of condensation or chemical reaction with stack gases following cooling to ambient temperature and pressure). EPA will consider all comments received prior to October 26, 2007 for incorporation in the initial posting of the method to this web site. Comments, recommendations, and justifications should be submitted to Ron Myers at myers.ron@epa.gov.

Since October 26, 2007, additional stakeholder sponsored laboratory studies were performed providing information justifying several minor modifications in the procedures of the draft dry impinger test method that was posted to this site. In addition, several stakeholders have provided recommendations for editorial and substantive changes in the posted method. We are now posting the dry impinger method to the "Other Test Methods" site as [OTM 28](#). We have made every effort to insure that the method provides an accurate and precise measurement of condensable particulate matter emissions. As with the previous draft dry impinger test method, we are soliciting comments on the method as posted and will consider all comments received prior to June 27, 2008. Comments, recommendations, and justifications should be submitted to Ron Myers at myers.ron@epa.gov.

Concurrent with the posting of the dry impinger test method to the Other Test Methods web page, we are posting an updated filterable PM10 and PM2.5 test method [OTM 27](#). OTM 27 is a reformatted and edited version of Conditional Test Method 40. As with OTM-28, we are soliciting comments on this method and will consider comments received by June 27, 2008.

Still have questions on this method? Contact the EMC expert Ron Myers at myers.ron@epa.gov.

Ray Merrill - Fw: Re: OTM 28 Ultrasonic Filter Extraction

From: <Myers.Ron@epamail.epa.gov>
To: <ray.merrill@erg.com>
Date: 6/28/2008 11:13 AM
Subject: Fw: Re: OTM 28 Ultrasonic Filter Extraction

Index 9

Ray:

While I'm not familiar with the various sonication devices, I would suspect that the device Peter describes is one that is inserted in the solvent and causes the solvent to vibrate. I would think this achieves the same function as placing the beaker or tube in a bath. The downside would be that the lab would have to be careful that the probe (horn) does not contaminate the sample.

Ron Myers
 U.S. Environmental Protection Agency
 Office of Air Quality Planning and Standards
 Sector Policy and Programs Division
 Monitoring Policy Group, D243-05
 RTP NC 27711
 Tel. 919.541.5407
 Fax 919.541.1039
 E-mail myers.ron@epa.gov

-----Forwarded by Ron Myers/RTP/USEPA/US on 06/28/2008 11:07AM -----

To: Ron Myers/RTP/USEPA/US@EPA
 From: "Peter Rossmiller" <prossmiller@barr.com>
 Date: 06/27/2008 06:26PM
 cc: "Richard Berg" <rob@barr.com>
 Subject: Re: OTM 28 Ultrasonic Filter Extraction

Ron,

Was there any advantage or preference as to using a sonic bath (extraction tube in water) or probe/horn style sonicator placed into the extraction tube with the filter and solvent?

Thanks for your help.

Pete

Sent by Good Messaging (www.good.com)

-----Original Message-----

From: Myers.Ron@epamail.epa.gov [<mailto:Myers.Ron@epamail.epa.gov>]
 Sent: Friday, June 27, 2008 05:17 PM Central Standard Time
 To: Peter Rossmiller
 Cc: ray.merrill@erg.com; Sorrell.Candace@epamail.epa.gov; Mcalister.Gary@epamail.epa.gov; Dewees.Jason@epamail.epa.gov
 Subject: Re: OTM 28 Ultrasonic Filter Extraction

Peter:

We are trying not to be too prescriptive where it is not necessary. The details on the type of sonicator and the beaker used is not that important. The key is getting the filter completely immersed in the extraction solvents (water first and MeCl next). The laboratory we use has a Branson Model 8510 sonicator, however most any sonic

bath used in analysis laboratories will do. With regard to the extraction procedure, a standard laboratory beaker can be used, or a 50 mL extraction tube (about 1 inch in diameter) seems to work fine for filters. We're assuming the CPM filter holds only soluble CPM. Since we have specified a Teflon membrane filter, if the CPM is not soluble, the sonication should dislodge the material from the filter and that insoluble material would be transferred to the water collected in the impingers and remain with either the organic extract or the inorganic fraction.

Ron Myers
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Sector Policy and Programs Division
Monitoring Policy Group, D243-05
RTP NC 27711
Tel. 919.541.5407
Fax 919.541.1039
E-mail myers.ron@epa.gov

-----"Peter Rossmiller" <prossmiller@barr.com> wrote: -----

To: Ron Myers/RTP/USEPA/US@EPA
From: "Peter Rossmiller" <prossmiller@barr.com>
Date: 06/27/2008 01:00PM
cc: "Richard Berg" <rob@barr.com>
Subject: OTM 28 Ultrasonic Filter Extraction

Ron,

We are preparing for some project work using OTM 27 and OTM 28. In the OTM 28 method, Section 11.2.1.1 (filter extraction), it mentions the use of a 50 mL "extraction tube" and a sonication bath.

Can you elaborate further on the equipment (extraction tube & sonication bath) that was used/intended for this method?

Any web links, equipment photos, diagrams, and/or vendors lists would be very much appreciated.

Thanks,

Pete Rossmiller

Barr Engineering Co.

4700 W. 77th Street
Minneapolis , MN 55435

Office: 952-832-2634

Cell: 612-240-6695

Fax: 952-832-2601

E-mail: prossmiller@barr.com

From: <Myers.Ron@epamail.epa.gov>
To: "Leslie Ritts" <lsritts@gmail.com>
CC: "Al Collins" <al_collins@oxy.com>, "Mike Babos" <babosm@merck.com>, "Ba...
Date: 7/1/2008 4:27 PM
Subject: Re: OTM 27 28 comments.pdf - Adobe Acrobat Standard

Index 10

Leslie:

Thanks for the comments on OTM 27 and 28. Some of the comments we will address in the next revision of OTM27 and 28. While it would be beneficial to all if the size of the OTM 27 sampling head could be reduced in size, the laws of physics are against us. We will assemble the documents that we have that were provided to EPA for the initial design of the five stage cyclone system to place in the docket. In addition, we will contact the particle physicist that designed the device to get some additional information on the impacts that would result if the equipment was made smaller. I believe that the size was established such that it would collect a representative sample of the particulate in the stack and that would minimize the time required to collect a mass that could be weighed on the typical scales available to stack samplers.

 Ron Myers

U.S. Environmental Protection Agency
 Office of Air Quality Planning and Standards
 Sector Policy and Programs Division
 Monitoring Policy Group, D243-05
 RTP NC 27711
 Tel. 919.541.5407
 Fax 919.541.1039
 E-mail myers.ron@epa.gov

"Leslie Ritts"
 <lsritts@gmail.com>

To

Ron Myers/RTP/USEPA/US@EPA

06/28/2008 11:53 AM

cc

"Al Collins"
 <al_collins@oxy.com>, "Andrew Trubin" <TRUHANA@KOCHIND.COM>, "Barbara Bankoff" <bbankoff@gmail.com>, "Bernie Paul" <bpaul@lilly.com>, "Cheeryl Russell" <cheryl.a.russell@boeing.com>, "Clara Maria Poffenberger" <claramaria.g.poffenberger@exxonmobil.com>, "Don Clay" <clayd@kochind.com>, "Donna Carvalho" <Donna.H.Carvalho@conocophillips.com>, <doug.l.deason@exxonmobil.com>, "Elliott Heide" <elliott_heide@oxy.com>, "Hannah Valmont" <valmonth@kochind.com>, "Jan. L. Laughlin@conocophillips.com" <Jan.L.Laughlin@conocophillips.com>, "Jerry B. Fulmer" <jerry.fulmer@alcoa.com>, "Jerry B. Fulmer" <jbfulmer@aol.com>, "Jodie L. Mitchell, Esq." <mitchell_jodie_l@lilly.com>, "Judy Bigon" <judy.m.bigon@exxonmobil.com>, "Kaufmann, Robert C." <RCKAUFMA@GAPAC.com>, "Keith

Long" <Keith.d.long@invista.com>,
"Kyle M. H. Jones"
<kmj23@chrysler.com>, "Lettrich,
Jeffrey J."
<Jeffrey.Lettrich@alcoa.com>,
"Maxine Dewbury"
<dewbury.md@pg.com>, "Michael A.
Palazollo"
<michael.palazollo@alcoa.com>,
"Mikal S. Innerarity"
<mikal.s.innerarity@exxonmobil.co
m>, "Mike Babos"
<babosm@merck.com>, "Nina J
Forehand"
<nina.j.forehand@exxonmobil.com>,
<pas2@chrysler.com>, "Robert J.
Morehouse"
<robert.j.morehouse@exxonmobil.co
m>, "Sheryl Corrigan"
<sheryl.corrigan@kochind.com>,
"Steven Meyers"
<steven.meyers@corporate.ge.com>,
"Tammy Wyles"
<trwyles@gapac.com>, "Todd Hyde"
<robert_hyde@merck.com>, "Todd
Rallison"
<todd.w.rallison@intel.com>

Subject

OTM 27 28 comments.pdf - Adobe
Acrobat Standard

Ron – some brief comments on other test methods 27 and 28 are attached.
Thank you for this opportunity to comment.

Leslie

Leslie Sue Ritts
Ritts Law Group, PLLC
620 Fort Williams Parkway
Alexandria, VA 22304
(571) 970-3721 (office)
(703) 966-3862 (cell)
lsritts@gmail.com

PRIVILEGE AND CONFIDENTIALITY NOTICE

This message is intended only for the use of the individual or entity to which it is addressed and may contain information that is privileged, confidential and exempt from disclosure under applicable law as attorney client and work-product confidential or otherwise confidential communications. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution, or copying of this communication or other use of a transmission received in error is strictly prohibited. If you have received this transmission in error, immediately notify us at the above telephone number.

June 27, 2008

By email

Ron Myers
Emissions Measurement Center
USEPA Office of Air Quality
Planning & Standards
Research Triangle Park, NC 22771
Myers.Ron@epa.epamail.gov

Members:
ALCOA Inc.
The Boeing Company
ConocoPhillips Company
Chrysler Corporation, LLC
Eli Lilly & Company
ExxonMobil Corporation
General Electric Company
Georgia-Pacific LLC
Invista Corporation, LLC
Koch Industries, Inc.
Merck & Co.
Occidental Petroleum Corporation
Procter & Gamble Company

Counsel: Leslie Sue Ritts

Re: Other Test Methods (OTM-27 and OTM-28)

Dear Mr. Myers:

The National Environmental Development Association's Clean Air Project (NEDA/CAP) is supportive of EPA's efforts to revise and improve the current condensable particulate matter method. Our comments on the development of the Revised Method 202/ Dry Impinger Method, and the release of OTM-27 (Filterable Particulate) and OTM-28 (Condensable Particulate) are set forth below.

OTM-27 (<http://www.epa.gov/ttnemc01/prelim/otm27.pdf>)

According to EPA's website, OTM-27 "supercedes" CTM-40. As you know, NEDA/CAP's members have practical concerns that affect OTM-27 (CTM-40), which principally concern the size of the testing apparatus and whether it can be easily accommodated on the majority of stacks. The sampling device measures 16 inches in length and the method calls for the device and filter to be maintained at stack temperature and conditions to avoid condensation prior to the filter. For smaller stacks sampling would appear to require the installation of four port holes, in order to get an accurate cross section of the stack velocity. However, in order to maintain stack temperature with four port holes, the stack diameter would still need to be 180 inches or 15 feet. In addition to installing more port holes, all ports must be 6 inches in diameter to accommodate the height of the sampling device. Adding port holes and larger diameters begin to deteriorate the structural integrity of the stack creating safety issues. EPA needs to address these concerns before finalizing OTM-27 because the revised method may require replacement or retrofit of stacks since the minimum stack diameter must theoretically be no less than 360 inches or about

30 feet in order to keep the sampling device and filter in the stack throughout the traverse.

In addition, it appears that the use of a heating element or insulation will be required in the new method to maintain the sampling device temperature at stack conditions. Given that most stacks diameters range anywhere from 18 to 60 inches and do not meet the minimum requirement to maintain the proposed in-stack temperatures throughout the traverse, EPA will need to address whether this condition can be achieved in the field or whether these requirements limit application of the method. In smaller diameter stacks issues of blockage (i.e., the relationship of the size of the probe's footprint to the area of the stack), become a concern. When the blockage exceeds 3%, then theoretical calculations must be applied to correct the results, which could impair the integrity of the sample results. NEDA/CAP is interested in how EPA intends to address this concern. Finally, EPA should consider whether the cost of this compliance test for companies can be reduced. For instance, we are concerned particularly by the cost of the increased sampling time for the PM_{2.5} fraction, which pursuant to the revised protocol would need to be substantially increased to collect sufficient mass to reduce potential weighing errors.

OTM-28: <http://www.epa.gov/ttnemc01/prelim/otm28.pdf>:

This method involves the extraction of both organic and inorganic particulate matter fractions from source emissions. NEDA/CAP urges EPA to provide in the revised method that in ambient source applications where nitrate and sulfate interferences are not detected, sources can eliminate the extraction process and determine the PM fractions gravimetrically after desiccation. This will eliminate the propagation of error from the quantitative transferring and weighing of both the organic and inorganic fractions to determine Total Particulate Matter (TPM). EPA also should consider whether the extraction of the inorganic fraction for ambient sources is necessary because it increases the laboratory analysis time, which in turn increases the cost of testing to the industry.

Thank you for this opportunity to provide comments on OTM-27 and 28. We look forward to further discussions with you.

Sincerely,

A handwritten signature in black ink, appearing to read "Leslie Ritts". The signature is fluid and cursive, with the first name "Leslie" written in a larger, more prominent script than the last name "Ritts".

Leslie Ritts, Counsel to
NEDA/CAP

From: <Myers.Ron@epamail.epa.gov>
To: Giedrius Ambrozaitis <gambrozaitis@autoalliance.org>
CC: "Leslie Ritts" <lsritts@gmail.com>, "Prokopy, William" <wrp6@chrysler.co...>
Date: 7/2/2008 7:53 AM
Subject: Re: Alliance comments on OTM-27 and OTM-28

Index 11

Giedrius:
 I received almost the same comments from NEDA-CAP. Your comment on the need for OTM 28 when the stack sample has already been filtered at less than 85 F is already in the method (at least OTM 28). We will review the text to see if it needs editing to be more clear. We did not have it in OTM 27 since it does not fit well into that method. If you still have concerns that people will mis apply the test methods, please make a comment after the proposal in the FR.

We will address some of your other comments in the next revision of OTM27 and 28. With respect to the size of the OTM27 sampling head, while it would be beneficial to all if the size of the OTM 27 sampling head could be reduced in size, the laws of physics are against us. We will assemble the documents that we have that were provided to EPA for the initial design of the five stage cyclone system to place in the docket. In addition, we will contact the particle physicist that designed the device to get some additional information on the impacts that would result if the equipment was made smaller. I believe that the size was established such that it would collect a representative sample of the particulate in the stack and that would minimize the time required to collect a mass that could be weighed on the typical scales available to stack samplers. Also, I believe that the stack dimensions that you cite are excessive. You are correct that to get to some of the sampling points, part of the sampling head is outside the stack. However, most stack samplers would cover the sampling head with rags, towels or other insulating material to insure that the temperatures are maintained within the equipment and that condensation does not occur.

Ron Myers
 U.S. Environmental Protection Agency
 Office of Air Quality Planning and Standards
 Sector Policy and Programs Division
 Monitoring Policy Group, D243-05
 RTP NC 27711
 Tel. 919.541.5407
 Fax 919.541.1039
 E-mail myers.ron@epa.gov

Giedrius
 Ambrozaitis
 <gambrozaitis@autoalliance.org>
 06/27/2008 02:00 PM
 To
 Ron Myers/RTP/USEPA/US@EPA
 cc
 Subject
 Alliance comments on OTM-27 and OTM-28

Dear Mr. Myers –
 Please find attached our comments on OTM-27 and OTM-28.
 Best regards,
 Giedrius Ambrozaitis

Alliance of Automobile Manufacturers
(248) 357-4796[attachment "Alliance comments on OTM 27 and OTM28 - June
27 2008.pdf" deleted by Ron Myers/RTP/USEPA/US]



June 27, 2008

Ron Myers
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Sector Policy and Programs Division
Monitoring Policy Group, D243-05
RTP NC 27711
Delivered via E-mail myers.ron@epa.gov

Re: Stakeholder Comments for the Other Test Methods (OTM-27 and OTM-28)

Dear Mr. Myers:

The Alliance of Automobile Manufacturers appreciates the opportunity to provide stakeholder comment on the Other Test Methods OTM-27 and OTM-28. As stakeholders, our efforts to revise and improve the current condensable particulate matter method have led to some substantial gains with the development of the Revised Method 202/ Dry Impinger Method, and the release of OTM-27 (Filterable Particulate) and OTM-28 (Condensable Particulate). Here are comments regarding those proposed test methods.

OTM-27:

- As stated in the e-mail correspondence by Ron Myers (EPA) on May 8th, 2008 to the stakeholders, OTM-27 is a revised version of the previous released CTM040 which is a combination filterable PM10 / PM2.5 speciation sampling device. Therefore, previous concerns regarding CTM040 including the foot print of the device is still the main focus.

For example: The sampling device measures 16 inches in length and the method calls for the device and filter to be maintained at stack temperature and conditions to avoid condensation prior to the filter. To achieve this, the minimum stack diameter must theoretically be no less than 360 inches or about 30 feet in order to keep the sampling device and filter in the stack throughout the traverse.

- The installation of four port holes, in order to get an accurate cross section of the stack velocity, may be necessary given smaller diameter stacks. However to maintain stack temperature with four port holes, the stack diameter would still need to be 180 inches or 15 feet. In addition to installing more port holes, all ports must be 6 inches in diameter to accommodate the height of the sampling device. Subsequently, the additional port holes and larger diameters begin to deteriorate the structural integrity of the stack leading to safety issues. All of which add an increased cost to industry to retro-fit or replace existing stacks.

BMW Group • Chrysler LLC • Ford Motor Company • General Motors
Mazda • Mercedes-Benz • Mitsubishi Motors • Porsche • Toyota • Volkswagen

- Given that most stack diameters range anywhere from 18 to 60 inches and do not meet the minimum requirement to maintain the proposed in-stack temperatures throughout the traverse, the use of a heating element or insulation will be required in the new method to maintain the sampling device temperature at stack conditions. This idea does not appear to be practical or feasible.
- In smaller diameter stacks issues of blockage, which is the relationship of the size of the probe's footprint to the area of the stack, become a concern. When the blockage exceeds 3%, then theoretical calculations must be applied to correct the results.
- The sample times, specifically for the PM_{2.5} fraction, must be significantly increased (i.e. potentially up to 4 hours or more per sample) to collect sufficient mass to reduce potential weighing errors, which directly increases the cost of a compliance test.

OTM-28:

- This method involves the extraction of both organic and inorganic particulate matter fractions from source emissions. Ambient source applications where nitrate and sulfate interferences are not detected, should be given the option to eliminate the extraction process and determine the PM fractions gravimetrically after desiccation. This will eliminate the propagation of error from the quantitative transferring and weighing of both the organic and inorganic fractions to determine Total Particulate Matter (TPM).
- The extracting of the inorganic fraction for ambient sources increases the laboratory analysis time, which in turn increases the cost of testing to the industry.

If you have any questions, please call me at (248) 357-4796.

Sincerely,



Giedrius Ambrozaitis
Director, Environmental Affairs

From: <Myers.Ron@epamail.epa.gov>
To: "Woolf, John" <John.Woolf@bgllp.com>
CC: "Robert Bessette" <bessette@cibo.org>, "Jaeger, Lisa" <Lisa.Jaeger@bgllp...>
Date: 7/2/2008 8:04 AM
Subject: Re: CIBO OTM-27, OTM-28 Comments

Index 12

John:
 Thanks for the comments on OTM 27 and 28. Some of the comments we will address in the next revision of OTM27 and 28. I am aiming for about two weeks from today. While it would be beneficial to all if the size of the OTM 27 sampling head could be reduced in size, the laws of physics are against us. I believe that the size was established such that it would collect a representative sample of the particulate in the stack and that would minimize the time required to collect a mass that could be weighed on the typical scales available to stack samplers. Making the device smaller means that sampling rate is decreased and sampling times are extended to collect the same mass on the filters, also making the sampler smaller and reducing the sampling rate means that the nozzle diameters are decreased and then collecting a representative sample of the stack gas becomes an issue. We will assemble the documents that we have that were provided to EPA for the initial design of the five stage cyclone system to place in the docket. In addition, we will contact the particle physicist that designed the device to get some additional information on the impacts that would result if the equipment was made smaller.

Ron Myers
 U.S. Environmental Protection Agency
 Office of Air Quality Planning and Standards
 Sector Policy and Programs Division
 Monitoring Policy Group, D243-05
 RTP NC 27711
 Tel. 919.541.5407
 Fax 919.541.1039
 E-mail myers.ron@epa.gov

"Woolf, John"
 <John.Woolf@bgllp.com>
 To
 Ron Myers/RTP/USEPA/US@EPA
 06/27/2008 04:14 PM
 cc
 "Jaeger, Lisa"
 <Lisa.Jaeger@bgllp.com>, "Robert Bessette" <bessette@cibo.org>
 Subject
 CIBO OTM-27, OTM-28 Comments

Mr. Myers,

Attached are comments by the Council of Industrial Boiler owners regarding Other Test Methods (OTM-27 and OTM-28). Please reply to this email to confirm receipt of these comments.

Thanks,

John Woolf | Government Relations & Strategy | Bracewell & Giuliani LLP
 2000 K Street NW Suite 500 | Washington, D.C. | 20006
 T: 202.828.7628 | F: 202.857.2104[attachment "As Filed - CIBO OTM-27

OTM-28 Comments 06-27-2008.pdf" deleted by Ron Myers/RTP/USEPA/US]



Representing the Interests of America's Industrial Energy Users since 1978

June 27, 2008

VIA E-MAIL

Ron Myers
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Sector Policy and Programs Division
Monitoring Policy Group
Research Triangle Park, NC 27711, Mail Code D243-05
myers.ron@epa.gov

Re: Other Test Methods (OTM-27 and OTM-28)

Dear Mr. Myers:

The Council of Industrial Boiler Owners (CIBO) appreciates the opportunity to comment on condensable particulate matter test methods OTM-27 ("Determining PM₁₀ and PM_{2.5} Emissions from Stationary Sources") and OTM-28 ("Dry Impinger Method for Determining Condensable Particulate Emissions from Secondary Sources").

CIBO is a broad-based association of industrial boiler owners, architect-engineers, related equipment manufacturers, and university affiliates consisting of over 100 members representing 20 major industrial sectors. CIBO members own or operate facilities in every region and state of the country, with a representative distribution of almost every type of boiler and fuel combination currently in operation. CIBO was formed in 1978 to promote the exchange of information within industry and between industry and government relating to energy and environmental equipment, technology, operations, policies, laws and regulations affecting industrial boilers. Since its formation, CIBO has actively participated in the development of technically sound, reasonable, cost-effective energy and environmental regulations for industrial boilers. CIBO supports regulatory programs that provide industry with enough flexibility to modernize – effectively and without penalty – the nation's aging energy infrastructure, as modernization is the key to cost-effective environmental protection.

CIBO members own or operate facilities that, as stationary sources, must perform stack-tests to measure filterable and condensable particulate matter emissions. These members are directly affected by the development, validation and promulgation of Other Test Methods (OTM) potentially useful to the emission measurement community.

Council Of Industrial Boiler Owners
6035 Burke Centre Parkway, Suite 360, Burke, VA 22015-3757 • Phone: 703-250-9042 Fax: 703-239-9042
E-Mail: cibo@cibo.org

CIBO supports generally EPA's efforts to improve air quality monitoring and improve particulate matter testing methods. CIBO shares the interests and concerns expressed by The Alliance of Automobile Manufacturers in its comments on OTM-27 and OTM-28, and encourages EPA to address the issues included in those comments so that test methods can be effectively utilized in the field.

In addition, relative to OTM-27, CIBO would like to stress concerns with the practicality of the probe design, handling requirements, and ability to maintain probe temperature. CIBO agrees that the sampling assembly would need to be heated to a temperature equal to stack gas temperature in order to prevent condensation. However, the only logical means of obtaining and maintaining overall probe temperature equal to stack gas temperature would appear to be electrically heating and insulating the overall probe and cyclones since a portion of the probe will remain out of the flow path during testing in smaller ducts/stacks. Assuming that a heat gun can be used to preheat the metal mass of the cyclones and interconnecting tubing under potentially adverse ambient conditions during testing does not appear practical. Design of a fully heated and insulated assembly would undoubtedly increase overall diameter vs that already indicated such that it would not fit through even a 6" test port, so that 8" ports would probably be required. It appears that the nozzle itself could be shortened to help minimize overall assembly diameter. CIBO recommends that EPA attempt to redesign the probe assembly so that it is a smaller overall diameter and that adequate cyclone/probe heating can be provided integral to the assembly without requiring extensive test port modifications or hit-or-miss manual preheating. There are a preponderance of 4" test ports utilized in industrial boiler applications and replacement of those ports would entail a significant cost.

CIBO also questions how sensitive the OTM-27 sampling results are to tipping of the probe following sampling (as noted in the procedure to be an issue) since handling this cumbersome of an assembly will be very difficult in many situations. EPA should ensure that typical test handling of the equipment will not induce an unpredictable bias into the results.

Relative to OTM-28, CIBO assumes that EPA will develop and include information regarding method precision and bias determined through testing on various types of fuels and conditions so that proper use of resulting data can be accomplished.

If you have questions or need clarification, please contact me at (703) 250-9042.

Sincerely yours,

/s/ Robert D. Bessette

Robert D. Bessette
President