Issue 1, February 2016

CleanAir Engineering

THE SOURCE

Complex measurement challenges now have a Single Source Solution

Fenceline Monitoring

New Benzene Fenceline Monitoring Rules

Reduction in 5,200 tons per year of toxic air pollutants and 50,000 tons per year of volatile organic compounds.

In December 2015, The USEPA published the final rule with additional emission control requirements for storage tanks, flares and coking units at petroleum refineries. This new rule is intended to significantly improve air quality in neighborhoods near petroleum refineries by further controlling toxics air emissions and requiring continuous fenceline monitoring of the toxic air pollutant benzene. Are you ready to meet the new standard?

These new requirements when fully implemented in 2018, will reduce toxic emissions from refineries, improve air quality and significantly reduce risk to public health in communities surrounding these facilities.

EPA is taking significant action to reduce toxic emissions from important emission sources within refineries by requiring continuous monitoring of benzene concentrations at the fenceline of refinery facilities to ensure that refineries appropriately manage toxic emissions from fugitive sources such as leaking equipment and wastewater treatment. Requiring corrective action will mean less pollution in neighboring communities. Monitors must encircle the facility to better identify sources of pollution under any wind direction. The fenceline monitoring required by this rule is able to detect benzene at very low levels. In addition, in response to what the EPA heard during an extensive public outreach, the rule provides room for alternative monitoring methods that will allow for real time monitoring in the future as technology advances and real time monitoring becomes capable of measuring these lower levels of benzene. If monitored fenceline emissions from the facility exceed the level established in this rule, a refinery will be required to take corrective action.

CleanAir Engineering's Volker Schmidt has been researching this issue and has been consulting with the EPA and companies affected by this new rule. If you are affected by this rule and could use a subject matter expert to help with your implementation plans, please feel free to reach out to Dr. Volker Schmid through email at vschmid@cleanair.com or by phone at our Pittsburgh facility (412) 787-9130.

Attend the 4C HSE Conference February 22-25, 2016

The 4C HSE Conference brings the Health, Safety, and Environmental communities together to collaborate with one another, connect with peers, contribute to industry compliance. 4C is focused on collaboration and education, bringing together the industry's most well known vendors and customers to make meaningful connections, and learn how we can all contribute to industry compliance. Attending from CleanAir Engineering in Booth #39, John Connell, James Pollack, Volker Schmid, Scott Evans, and Dan Pearson. Contact Gene Grilli at ggrilli@cleanair.com for your free expo hall passes.

Particle Pollution

PM

Particle pollution (also called particulate matter or PM) is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope.

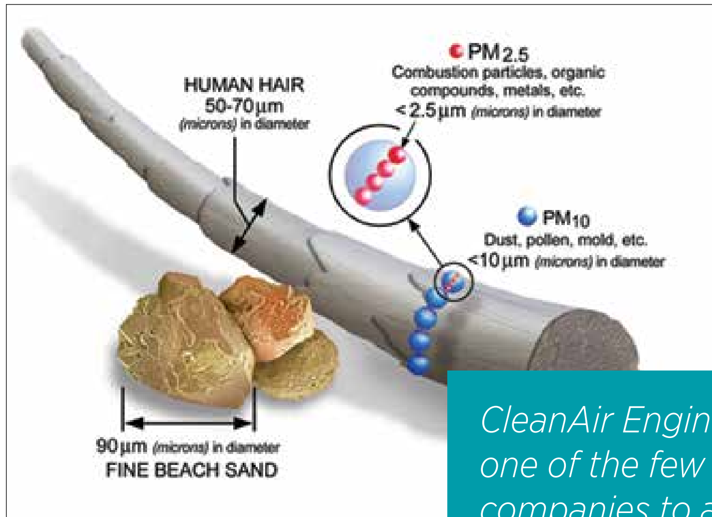
Particle pollution includes "inhalable coarse particles," with diameters larger than 2.5 micrometers and smaller than 10 micrometers and "fine particles," with diameters that are 2.5 micrometers and smaller. How small is 2.5 micrometers? Think about a single hair from your head. The average human hair is about 70 micrometers in diameter – making it 30 times larger than the largest fine particle.

These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as *primary particles* are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks or fires. Others form in complicated reactions in the atmosphere of chemicals such as sulfur dioxides and nitrogen oxides that are emitted from power plants, industries and automobiles. These particles, known as *secondary particles*, make up most of the fine particle pollution in the country.

EPA regulates inhalable particles (fine and coarse). Particles larger than 10 micrometers (sand and large dust) are not regulated by EPA (Source EPA Website)

CleanAir Engineering is one of the few global companies to achieve accreditation for all elements required by ASTM D7036 by the STAC Council and is properly trained to source test for particulate mater.

Basic Method 5 Sampling Train



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But what you may not know is CleanAir Engineering's Jim Guenthoer while under Dr. Pilat at the University of Washington helped pioneer testing methods and equipment designs that would later be used for particulate matter sizing in wet gas streams.

Two things you want to know to determine how sampling will be performed is:

- Do we want to know what will the plume look like after any carryover has evaporated? This provides size distribution of the PM residue that is released from the droplets when they evaporate in the plume in the ambient air.
- Do we want to know the actual PM versus droplet makeup of the gas stream? This gives us a "Wet" and a "Dry" size distribution to assess the impact of PM containing droplet carryover.

With over 40 years in the environmental measurement field including over 35 years in air emission testing and consulting, Jim Guenthoer has become known industry wide as a trusted authority on source testing. Please contact Gene Grilli at ggrilli@cleanair.com or 281.443-6400 to arrange for Jim Guenthoer to speak at your next team lunch and learn.

everybody knows how to clean glasses, but no, apparently there's a lot more to it than just hot soapy water and a good rinse . . .

CleanAir Engineering Difference

I learned how to wash dishes as a little boy, my mom taught me early on the importance of making sure the soap and water I used was hot and that the dishes needed to be thoroughly rinsed with clean water before drying to make sure nobody got sick from contamination.

When my wife catches me not busy, I still wash dishes the same way my mom taught me. I know automatic dishwashers have made the process a lot easier since I was growing up, but I still like washing by hand.

So when my business team leader Kevin Farwell was showing off his new dishwasher and oven to me, I didn't immediately realize what a big deal and how important these two items really are when stack testing properly. To me a dishwasher was a dishwasher and an oven was just an oven, yeah maybe a few extra cleaning cycles or timer functions maybe a selfcleaning feature or convection option, but basically everybody owns one of the modern appliances in one form or another.

Then I fielded a call from one of our local competitors asking if we could help them out and clean their glassware. I thought they were joking, everybody knows how to clean glasses, but no, apparently there's a lot more to it than just hot soapy water and a good rinse, they were having a problem passing some emission compliance startup testing because the samples were contaminated before ever making it to the stack.

Little things cause big problems...

Because the glassware had not been cleaned properly this resulted in a lot of wasted time and manpower, with a whole lot of finger pointing, and time was running out.

This is where the CleanAir Engineering advantage comes in, with over 44 years of emission testing and consulting experience CleanAir knows the importance and value of using an industrial high temp dishwasher followed by baking your glassware in an industrial oven at 300°C. These steps insure the glassware we use on your job is clean and not contaminated.

At CleanAir we take glassware cleanliness very seriously, insuring every mobilization has enough clean glassware for each sample that will be taken. After completion of each mobilization the glassware is returned to our state of the art laboratory for the inspection and cleaning before being used again.

It may sound like a minor item, but if you use a stack-testing firm that goes from job to job without cleaning their glassware properly, you may find your test results are not just from your stack but an accumulation of the previous tested stacks since the last time the glassware was properly cleaned, if ever.

For more information on our glassware cleaning, contact Kevin Farwell at kfarwell@cleanair.com and he can fill you in on all the things your mom left out.

— Gene Grilli

GLASSWARE

Glassware Washer

Exportable Data of wash settings and actual wash conditions

High Temperature –up to 199°F water removes lipids and sanitizes using deionized, ultra-filtered water

Forced air drying with 99.7% HEPA air filter.

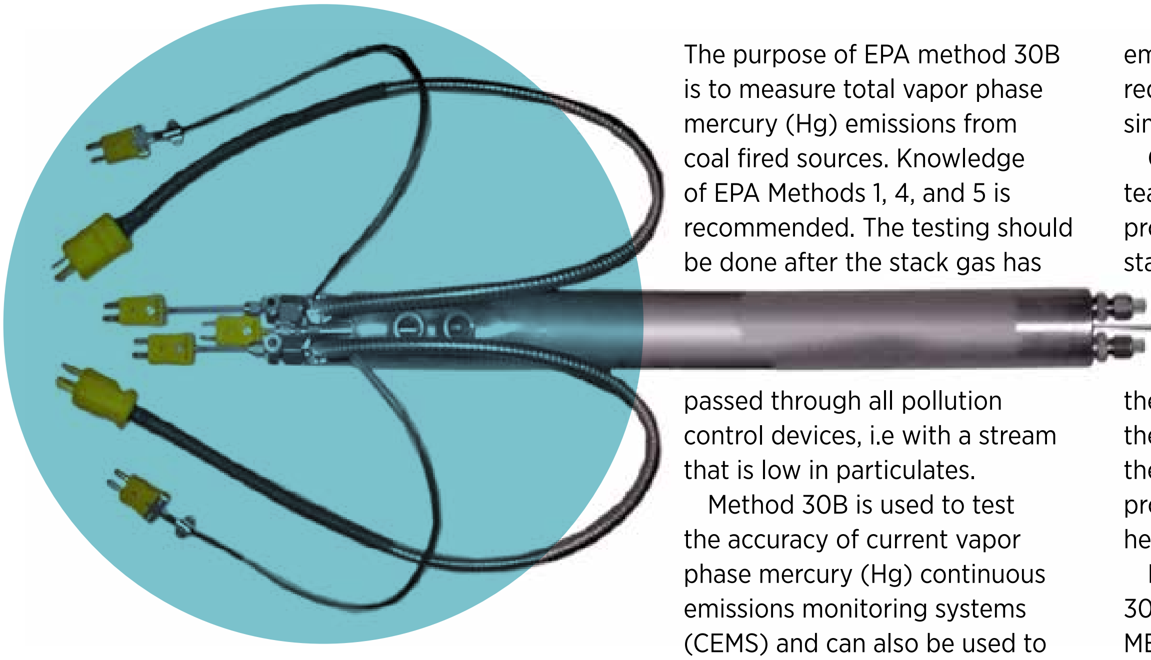
Convection Oven

Forced air oven uses a microcontroller to enhance precision, accuracy and uniformity.

Built in temperature calibration

Stainless steel interior with a double glazed observation window

Method 30B Mercury (Hg) Emissions



Air Cooled Heated Probes are used for temperatures over 300ºF and for speciated Hg sampling

The purpose of EPA method 30B is to measure total vapor phase mercury (Hg) emissions from coal fired sources. Knowledge of EPA Methods 1, 4, and 5 is recommended. The testing should be done after the stack gas has passed through all pollution control devices, i.e with a stream that is low in particulates.

Method 30B is used to test the accuracy of current vapor phase mercury (Hg) continuous emissions monitoring systems (CEMS) and can also be used to test for the compliance of mercury emissions standards. This method requires a minimum of two simultaneous sampling trains.

CleanAir Engineering testing teams utilize a heated sampling probe that features a unique stainless steel sheathed design that allows quick and easy replacement of speciated sorbent traps, stack thermocouple, probe thermocouples, and trap thermocouples. The air-cooled probe heaters are designed to heat each trap independently.

For more information on Method 30B, please contact Tim O'Connor MET-TEAM@cleanair.com or call 800-632-1619.

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History of Controlled Condensation Methods

During the early 1970's, the American Society for Testing Materials (ASTM) developed a test method in order to try to accurately determine the H2SO4 concentrations in coal-fired power plants. This method known as D3226-73T, published as a tentative test method in 1973, uses a glass condenser coil followed up by a frit kept in a hot water bath (150°F - 180°F). This temperature is low enough to condense out any gaseous SO3 and high enough to keep from condensing and collecting any moisture. However, some problems were encountered with the test method. The original test method used a glass wool plug at the probe tip as a filter.

It was found that particulate matter could adsorb SO3 during sampling and low results were obtained. This procedure incorporated the use of a quartz-lined probe at 600 ºF and a quartz filter at 550 ºF. These elevated temperatures assured little or no adsorption of gaseous SO3 onto glassware (probe) or onto dust caught on the filter.

Interestingly enough, ASTM dropped test method D3226- 73T in 1978 following publication of the TRW paper.

This report and the associated procedure were developed in response to a perceived need for a practical, portable, and reliable H2SO4 sampling system. It builds on the work of previous investigators including the ASTM, Dietz, Maddalone, and Cheney. This system formed the basis of what became known as the "Consol Method" as reported by the late Matt Devito.

The information contained in the MACS report does not constitute a formal EPA source testing methodology, and was probably not intended to be one. The report provides general guidelines for building and using the MAC sampling system in the field. It is lacking in areas quality assurance, quality control, audit samples, and field blanks.

Next issue we'll explore CleanAir Engineering's development of Method 8B for controlled condensation.