

Reactions

The newsletter of the Wisconsin Occupational Health Laboratory, the industrial hygiene arm of the Wisconsin State Laboratory of Hygiene

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Media matters 101

Of all the questions we field from occupational health professionals here at the Wisconsin Occupational Health Laboratory, the most common relate to sampling media issues.

That's hardly a surprise — we supply close to 100 different media types, many of which are very similar, making it sometimes difficult to remember which is the appropriate media type for a given analysis.

Many situations are unique and require consultation with one of the analysts here at the laboratory. However, there are a number of questions which we answer on a regular basis — and do so in this issue of *Reactions*.

Please take a minute to check out some of the frequently asked questions and our other suggestions for proper sampling inside. We've also included articles on some of our newest sampling techniques, reminders on some points of interest, and updates to our sampling guide.

Consider dropping this newsletter in your car or briefcase and using it as a quick reference. It could prevent you from using the wrong media — and save you the headache and expense of resampling.

Minican sampling now available at WOHL

The Wisconsin Occupational Health Laboratory recently added a new tool for analysis of indoor air quality situations by gas chromatography-mass spectrometry — Silonite™ coated minican samplers.

The minican samplers use the same technology employed by 6-liter summa canisters, but are just 400 mL in volume. This smaller size allows for personal sampling (with the attachment of the minican sampler to a belt) as well as area sampling.

Another nice feature of the minican samplers is that they have no power requirements. The samplers can be



fitted with a wide variety of flow restrictors that allow sampling to range from a 2-second grab sample all the way to an 8-hour time-weighted average sample.

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Size matters: Selective sampling

Size-selective sampling can present a confusing situation for occupational health professionals.

Typically, particulate samples fall into one of four categories (from smallest to largest): respirable, thoracic, total, and inhalable. The Wisconsin Occupational Health Laboratory offers media and analysis for all except thoracic, which has no

standard exposure limit.

❖ **Respirable dust samples** are collected with standard 37-mm cassettes connected to a cyclone, which separates out only the smallest particles (typically with a cutpoint of 4 microns or less in diameter).

WOHL recommends using

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Have you checked out www.wohlab.com yet? The site was designed with you, our customers, in mind. Take a look at www.wohlab.com the next time you need supplies, answers to your technical questions, or to learn more about the wide range of analytical services offered by WOHL.

More WOHL news inside:

- ❖ Answers to sampling media FAQs/**Page 2**
- ❖ What's new in the WOHL sampling guide/**Page 2**
- ❖ Direct microscopic microbial examination offered/**Page 3**
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Sampling media Frequently Asked Questions

Q. Which samples need to be shipped on ice?

- ❖ Aldehydes on DNPH or Waters Seppacs
 - ❖ Acetic anhydride
 - ❖ Asbestos in drinking water
 - ❖ Benzoyl peroxide
 - ❖ Butadiene
 - ❖ Culturable bacteria and fungi air samples (e.g. Andersen)
 - ❖ Ethyl and methyl cyanoacrylate (ship on dry ice)
 - ❖ Ethylene, propylene, and dipropylene glycols
 - ❖ Formic acid
 - ❖ Glutaraldehyde
 - ❖ *Legionella* water samples
 - ❖ Maleic anhydride
 - ❖ MEK peroxide
 - ❖ Methyl chloride
 - ❖ Methyl methacrylate
 - ❖ Nicotine
 - ❖ Phthalic anhydride
 - ❖ Propylene oxide
 - ❖ Trimellitic anhydride

Q. Which samples need to be field desorbed and in what?

- ❖ Acrylamide filter (1 mL methanol)
- ❖ Hexavalent chromium if

collected as plating operations, chromic acid, or where Cr+6 is present with acids (5 mL 10% sodium carbonate : 2% sodium bicarbonate; solution included with sample media upon request). Note -- do not field desorb welding samples.

- ❖ Isocyanates (see next question)
- ❖ MDA filter (2 mL water)
- ❖ MOCA filter (2 mL water)
- ❖ O-tolidine filter (2 mL water)
- ❖ 1,3,5 triglycidyl isocyanurate (3mL DMF)

Q. What is the sampling procedure for isocyanates?

That depends on the type of isocyanate. For toluene diisocyanate or hexamethylene diisocyanate, TDI filters are recommended. For methylene bisphenol diisocyanate, polymeric isocyanates, or aerosols, MDI filters are recommended. Field desorption (in 2 mL 90% acetonitrile : 10% DMSO) is only necessary in aerosol or very dusty situations. Field desorption can be avoided if an impinger filled with a toluene/PP solution is used in sequence with an MDI filter. In either case, sampling must be limited to 15 minutes.

Q. Can Palintest wipes be used to test for other metals besides lead?

Yes, however our detection levels for several metals are higher with Palintest wipes than the preferred media, Whatman wipes.

Q. Can vacuans be used to sample for carbon dioxide or nitrous oxide?

Yes, but the detection limits will be higher than they would be if the recommended media – tedlar bags or minican samplers – were used.

Q. Should the plugs on air filters be secured with tape?

It is not necessary -- the plugs will stay in place unless they or the cassette inlets have been damaged. In fact, applying tape slows down the analysis process.

Q. Can the bar code number on air filter cassettes be used as a sample ID?

It is not recommended because the bar code numbers are not unique, therefore two samples could have the same ID number.

WOHL Sampling Guide updates and additions

- ❖ The new media for diethyl amino ethanol is phosphoric acid treated XAD-7 (No. 63).
- ❖ The new media for diborane is SKC 226-151 coated charcoal tubes.
- ❖ The minimum volume for elemental carbon is 480 L.
- ❖ The shelf life for Cl/Br filters is 8 months; the shelf life for DNPH filters is 3 months.
- ❖ The updated information for hydroquinone is phosphoric acid treated XAD-7 media (No. 63); 1.5 L min. vol.; 20L max. vol.; 0.2 L/min flow rate; no field desorption.
- ❖ There is a new entry for dimethylethanolamine – media H₂SO₄ coated silica gel tubes (No. 34); ref. method NIOSH 2007; 1L min. vol.; 10 L max. vol.; 0.1 L/min flow rate.

Know your size-selective sampling techniques

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yellow-banded 5-micron polyvinyl-chloride (PVC) filter cassettes, which come in 2- or 3-piece varieties depending on the requirements of the cyclone used, for respirable dust sampling. MSA cyclones — which WOHL supplies — work best with 2-piece cassettes, while SKC cyclones attach to 3-piece cassettes.

Bear in mind that WOHL does not distinguish between respirable and total dust samples. Both types are analyzed identically, so please specify respirable dust on the submission form if a cyclone was used.

❖ **Total dust samples** are collected using a standard closed-faced cassette. WOHL recommends using 5-micron, yellow-banded PVCs for most situations, and 0.8-micron, 37-mm red-banded PVC filters for welding operations.

❖ **Inhalable dust samples** usually collect much more dust than total samples, so they must be sampled using an IOM monitor. This sampling is similar to collecting air samples open-faced. WOHL can provide IOM monitors, but supplies are limited so please call ahead with requests for this media type.



Can't wait a week? Try direct microbial microscopic analysis

Sometimes, results just can't wait.

Such as during home or building investigations, when rapid identification of a fungal growth is essential, and waiting seven days for a standard culture sample is simply not an attractive option.

We have a solution.

The Wisconsin Occupational Health Laboratory offers a service in which bulk or wipe samples are washed in a minimal amount of sterile water and examined microscopically for the presence of fungal spores and elements.

By this procedure, analysis can be performed and results can be reported in a very short amount of time. The standard turnaround time for this analysis is three business days from the date received at the laboratory, but results can be reported on the same day as the samples are received if rush analysis arrangements are made.

Direct microscopic examination of wipe and bulk samples results are reported as the presence of spores and fungal elements observed. Predominant quantities reported are relative to the sample.

Most molds are identified to genus level, while some spore

types with similar microscopic characteristics are reported as groups.

Aspergillus/Penicillium species, *Bipolaris/Dreschlera/Helminthosporium* and *Pithomyces/Ulocladium* species are used to report these similar spores.

Basidiospores, ascospores, zygosporae, arthroconidia and myxomycetes/rusts/smuts are used to report these types of spores.

Miscellaneous is used to describe unidentifiable spores or fungal elements.

It is important to note that biases may result due to sampling inefficiencies, and that samples received may not be representative of the total sample area of contamination. Also, the minimum concentration of spores and fungal elements detected in a direct microscopic examination of a bulk or wipe sample is dependent on sample area, collection and sample processing.

Presently, there are no standard procedures for handling and interpreting fungal spore results from the environment. However, this analysis can serve as a quick confirmation of building material fungal source contamination.

Minican samplers a good option for VOC testing

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The fact that they are Silonite™ coated makes the minicans suitable for the collection of a wider array of volatile organic compounds, including permanent gases and sulfur containing compounds.

WOHL has designed a customized approach to reporting results based on the needs of the sampling situation. We not only supply quantitation of the most

common VOCs, but also report semi-quantitative results for tentatively identified library matches where a standard is not available. We add an indication of the quality of the identification in these cases. This strategy gives you a full spectrum of air quality results.

There is no additional cost for this media, which is reusable. Please give us a call to discuss how this technique can be used for your next sampling.

How to reach us: Staff directory

ADMINISTRATION

WOHL director

Terry Burk
(608) 224-6215
tb@mail.slh.wisc.edu

Customer service

Kathy Loehr-Lishka
(608) 224-6210
loehrlka@mail.slh.wisc.edu

Dee Ann McGary
(608) 224-6210
dam@mail.slh.wisc.edu

Information tech.

Eric Maly
(608) 224-6236
malyec@mail.slh.wisc.edu

Dave Schleis
(608) 224-6227
dave@mail.slh.wisc.edu

Quality control

Donna Johnsen
(608) 224-6298
drjohnse@mail.slh.wisc.edu

Derek Popp
(608) 224-6298
dp@mail.slh.wisc.edu

Shipping

Larry Yonash
(608) 224-6214
tb@mail.slh.wisc.edu

BIOAEROSOLS

Bioaerosols tech. chief

Christine Powell
(608) 224-6261
powellcj@mail.slh.wisc.edu

Molds, spores, bacteria

Paul Eglsaer
(608) 224-6261
pee@mail.slh.wisc.edu

Curtis Hedman
(608) 224-6261
hedmancj@mail.slh.wisc.edu

Terri Ellinger
(608) 224-6261
ellingt@mail.slh.wisc.edu

INORGANICS

Inorganics supervisor

Lyle Reichmann
(608) 224-6216
lr@mail.slh.wisc.edu

Asbestos

Dick Kittel
(608) 224-6222
rlk@mail.slh.wisc.edu

John Knight
(608) 224-6222
jk@mail.slh.wisc.edu

Bill Steele
(608) 224-6222
ws@mail.slh.wisc.edu

Chromatography

LeRoy Dobson
(608) 224-6223
ld@mail.slh.wisc.edu

John Glowacki
(608) 224-6224
jglow@mail.slh.wisc.edu

Metals

Shakker Amer
(608) 224-6225
saa@mail.slh.wisc.edu

Mike Grochowksi
(608) 224-6226
mg@mail.slh.wisc.edu

Doug Smieja
(608) 224-6225
ds@mail.slh.wisc.edu

Weights

John Draeger
(608) 224-6297
draeger@mail.slh.wisc.edu

ORGANICS

Organics supervisor

Steve Strebel
(608) 224-6216
ss@mail.slh.wisc.edu

Mass Spectrometry

Mark Mieritz
(608) 224-6218
mm@mail.slh.wisc.edu

Non-routine

Alan Cormack
(608) 224-6218
abc@mail.slh.wisc.edu

Dan Omilianowski
(608) 224-6217
do@mail.slh.wisc.edu

Pesticides

Mark Hudziak
(608) 224-6218
mh@mail.slh.wisc.edu

Solvents

Adam Bednarek
(608) 224-6219
ab@mail.slh.wisc.edu

Jim Blair
(608) 224-6219
jeb@mail.slh.wisc.edu

Michael Jager
(608) 224-6219
jagermj@mail.slh.wisc.edu

Cheri Johnson
(608) 224-6218
cj@mail.slh.wisc.edu

Tony Liebig
(608) 224-6219
al@mail.slh.wisc.edu

Kathleen Reihbandt
(608) 224-6220
kr@mail.slh.wisc.edu

Shari Schwabe
(608) 224-6218
sls@mail.slh.wisc.edu

Two WOHL personnel elected to AIHA boards

Two members of the Wisconsin Occupational Health Laboratory's staff have assumed posts within the American Industrial Hygiene Association.

❖ Christine Powell, Technical Manager of WOHL's Bioaerosols Unit, has been elected to the AIHA Analytical Accreditation Board. The AAB oversees the governance and processes related to the AIHA Laboratory Quality Assurance Programs, which establishes and maintains standards of performance for laboratories analyzing occupation-

al and environmental samples.

Powell will be representing the Environmental Microbiology Laboratory Accreditation Program.

❖ Derek Popp, WOHL's Quality Control Coordinator, has been appointed to the AIHA Technical Advisory Panel, which advises the AAB through task forces, accreditation policy input, and quality control on the accreditation procedure.

Popp will be representing the Environmental Lead and Industrial Hygiene Laboratory Accreditation Programs.




Christine Powell, left, and Derek Popp

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Wisconsin Occupational Health Laboratory
Wisconsin State Laboratory of Hygiene
2601 Agriculture Drive
Madison, WI 53718

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