Paperless QC Micro
Webinar Series

Introducing Hach's MET ONE Compliance Workflow System™ for Paperless Air Monitoring Powered by MODA

Presented by

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Agenda

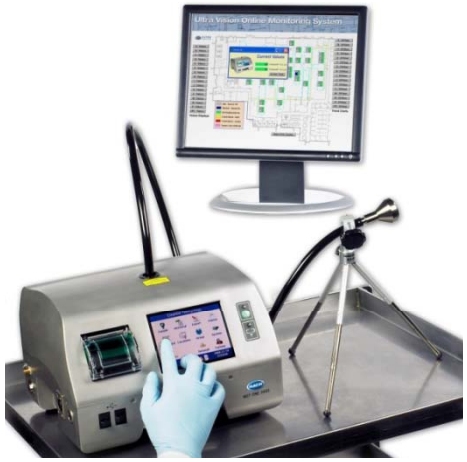
- Introduction to Hach Company and MODA Technology Partners
- Air Particle Monitoring in the Pharmaceutical Industry
- Paper-based vs. Paperless Air Particle Monitoring Processes
- MET ONE Compliance Workflow System Demo
- Summary of Features and Benefits
- Questions and Answers

A copy of this presentation and recording to this live session will be available for download at www.modatp.com and www.hach.com shortly after the presentation.

MET ONE Air Particle Counters

- The Hach MET ONE brand is the world's leading series of airborne particle counters for regulatory compliance

MET ONE HHPC
Handheld particle counter
Used for troubleshooting



MET ONE 3400 Series
Cleanroom classification
Environmental monitoring
Short-term online sampling

MET ONE 6000 & 7000 Series
for production monitoring Grade A & B areas

MODA Technology Partners

- Provide mobile data acquisition solutions that automate regulated manufacturing processes
  - Pharmaceuticals to consumer products
- Office locations
  - Wayne, PA Headquarters (suburban Philadelphia)
  - London, England
- World-wide sales in North America, Europe, and Asia
- Strategic partners

MODA: Value Proposition

- More science. Less paper.
  - Quickly move from paper-intensive QC Monitoring & Analysis
- Increase operational efficiency, improve quality, reduce costs
  - MODA-EM™ offers mobile computing technology and advanced visualization tools

MET ONE and MODA Partnership

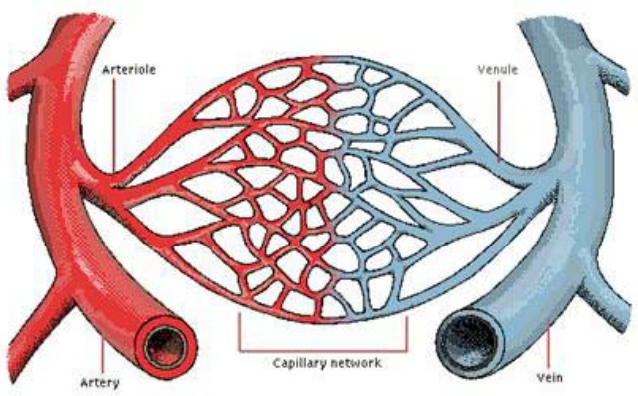
- Environmental monitoring is the most labor intensive aspect of many particle monitoring programs and it generates the most paper
- Since 2007, MET ONE and MODA have worked together to develop an automated solution for environmental monitoring for our customers

MET ONE & MODA Partnership

- MET ONE Compliance Workflow System (MET ONE CWS)
  - Affordable and low-impact entry point for paperless quality control monitoring and analysis of non-viable particle counts
- Leverages MODA-EM specific features:
  - Scheduling & Workflow
  - Data Acquisition and Storage
  - Alert and Action Notifications
  - Reporting and Analytical Trending Tools
- Now available for all existing and future MET ONE 3400 series air particle counters from Hach Company

Why do we care about Particle Counts?

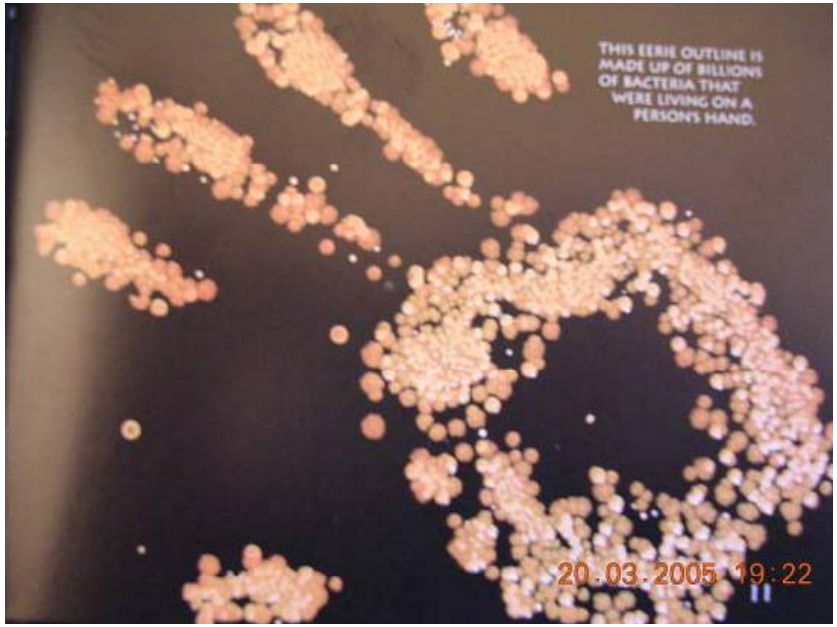
- **Particles as "contamination" negatively affect a process or product**
  - Chemical composition
  - Stability
  - Purity
  - Safety
  - Reliability



- **Pharmaceutical, Biotechnology**
  - Particles in injection could cause occlusion of blood vessels
    - Red Blood cells are about 5 µm
    - Capillary (5 to 10 µm)
    - Large veins (10 to 50 µm)
  - Viable particles in injection can trigger infection
  - Possibility of reaction to foreign substances (RES/allergic reaction)

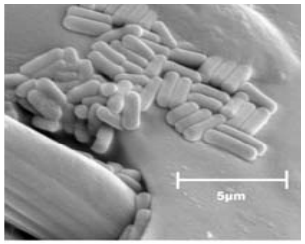
Why monitor for particles?

Greatest concern is for viable microorganisms



Non-viable particle count monitoring is a critical component of the total Environmental Monitoring program

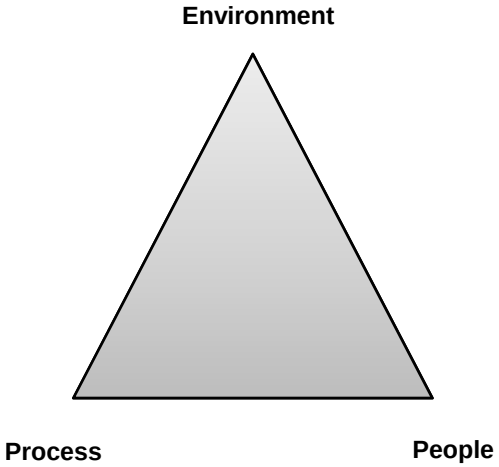
- Technology is not available today to measure viable counts in real time
  - Requires incubation time
- Total “non-viable” particle counts used as a surrogate
- Non-viable counts
  - Includes all types of airborne material
    - Solid particles
    - Fibers
    - Microorganisms
    - Skin flakes



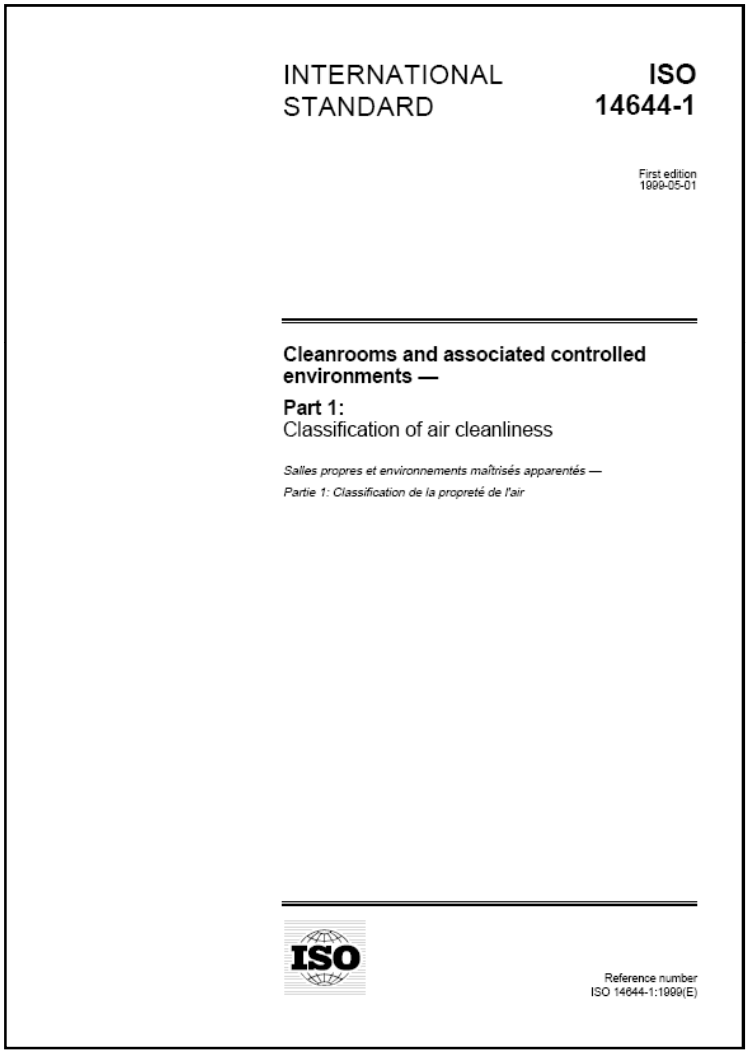
- Non-viable particle counting offers potential for real-time response

Non-Viable Particle Count Monitoring

- ***Classification of Cleanrooms*** – formal process to ensure the environment meets class standard
  - Rigid standards apply (ISO14644)
- ***Aseptic Process Monitoring*** – risk-based process to ensure that the people, process and the environment remain in control during the desired task
  - cGMP/GMP Guidance from FDA/EMEA
- ***Environmental Monitoring*** – risk-based process to verify that the environment is ready to carry out the desired task
  - Inferred guidance, not rigid by regulation



Cleanroom and Clean Zone Classification



INTERNATIONAL STANDARD

ISO 14644-1

First edition
1999-05-01

Cleanrooms and associated controlled environments —

Part 1:
Classification of air cleanliness

Salles propres et environnements maîtrisés apparentés —
Partie 1: Classification de la propreté de l'air

ISO

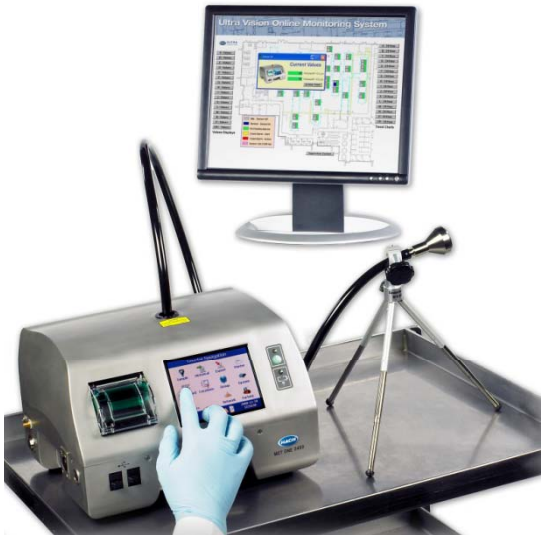
Reference number
ISO 14644-1:1999(E)

- Classification is the formal process of qualifying the environment by the number of particles using a standard method (ISO 14644)
  - Performed on a regular basis but not frequently
    - Grade A areas: Six months, “ISO 4.8”
    - Grade B areas: Six months, ISO 5
    - Grade C, D areas: Annually, ISO 7/8
  - Standards define minimum number of points
    - Based on area of cleanroom or clean zone
  - Standards define minimum amount of air to be sampled
    - Minimum volumes for statistically valid samples (typically 1 minute at 1 cfm)
    - Grade A requires minimum 1 m3 (Annex 1)

Classification is a rigid protocol

ISO 14644 Classification Limits

Class	Number of Particles per Cubic Meter by Micrometer Size					
	0.1 µm	0.2 µm	0.3 µm	0.5 µm	1 µm	5 µm
ISO 1	10	2				
ISO 2	100	24	10	4		
ISO 3	1,000	237	102	35	8	
ISO 4	10,000	2,370	1,020	352	83	
ISO 5	100,000	23,700	10,200	3,520	832	29
ISO 6	1,000,000	237,000	102,000	35,200	8,320	293
ISO 7				352,000	83,200	2,930
ISO 8				3,520,000	832,000	29,300
ISO 9				35,200,000	8,320,000	293,000



Typically performed with portable counters

Aseptic Process Monitoring

- Governed by EMEA and FDA Guidance
  - For critical (Grade A) areas and Grade B
  - Recommends continuous monitoring
- Number of sample points based on risk assessment
  - Minimum locations is well defined by common practice
- Location of points based on risk assessment
  - Some guidance on sampling location
- Sample volumes defined by need for event detection

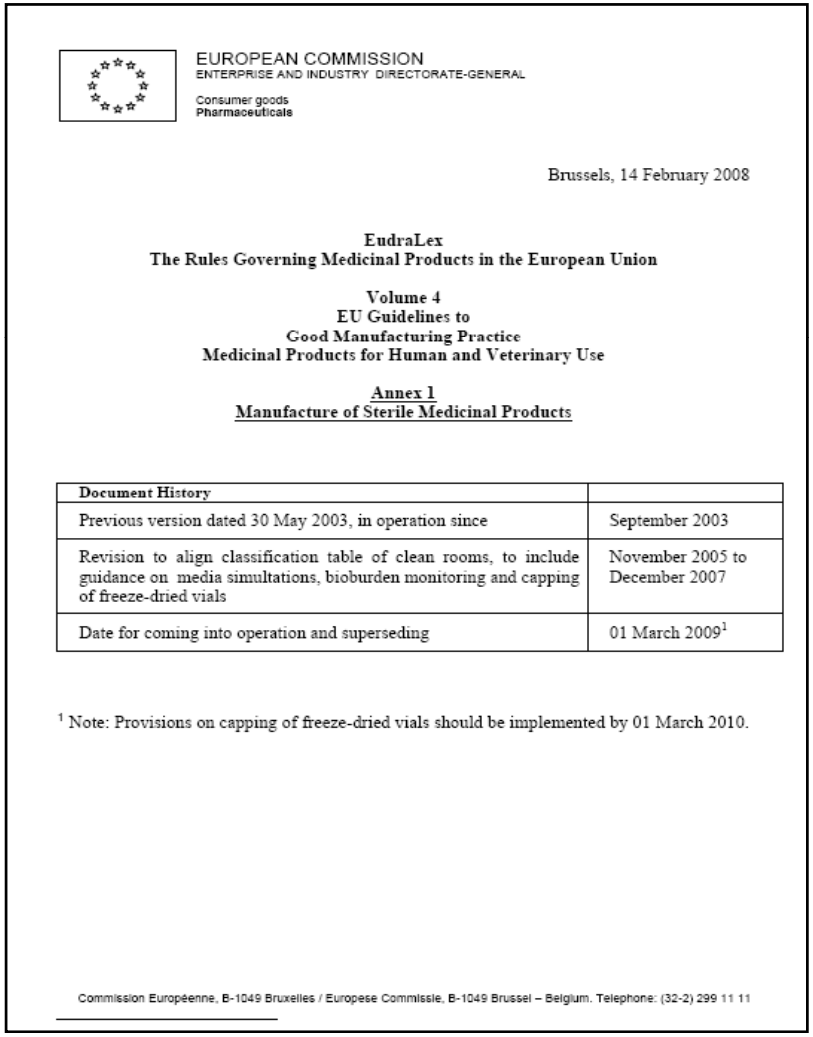
Published guidance, industry practice

May be manual or automated remote process

Aseptic Process Monitoring

- Pharmaceutical Industry Compliance Guidance
  - FDA cGMP Guidance for Industry
    - Sterile Drug Products Produced by Aseptic Processing
  - EU GMP Annex I (EMEA)
    - Manufacture of Sterile Medicinal Products

EU GMP Annex 1 is more rigid than FDA cGMP Guidance



EUROPEAN COMMISSION
ENTERPRISE AND INDUSTRY DIRECTORATE-GENERAL
Consumer goods
Pharmaceuticals

Brussels, 14 February 2008

EudraLex
The Rules Governing Medicinal Products in the European Union

Volume 4
EU Guidelines to
Good Manufacturing Practice
Medicinal Products for Human and Veterinary Use

Annex 1
Manufacture of Sterile Medicinal Products

Document History	
Previous version dated 30 May 2003, in operation since	September 2003
Revision to align classification table of clean rooms, to include guidance on media simultations, bioburden monitoring and capping of freeze-dried vials	November 2005 to December 2007
Date for coming into operation and superseding	01 March 2009[1]

[1] Note: Provisions on capping of freeze-dried vials should be implemented by 01 March 2010.

Commission Européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel – Belgium. Telephone: (32-2) 299 11 11

Environmental Monitoring

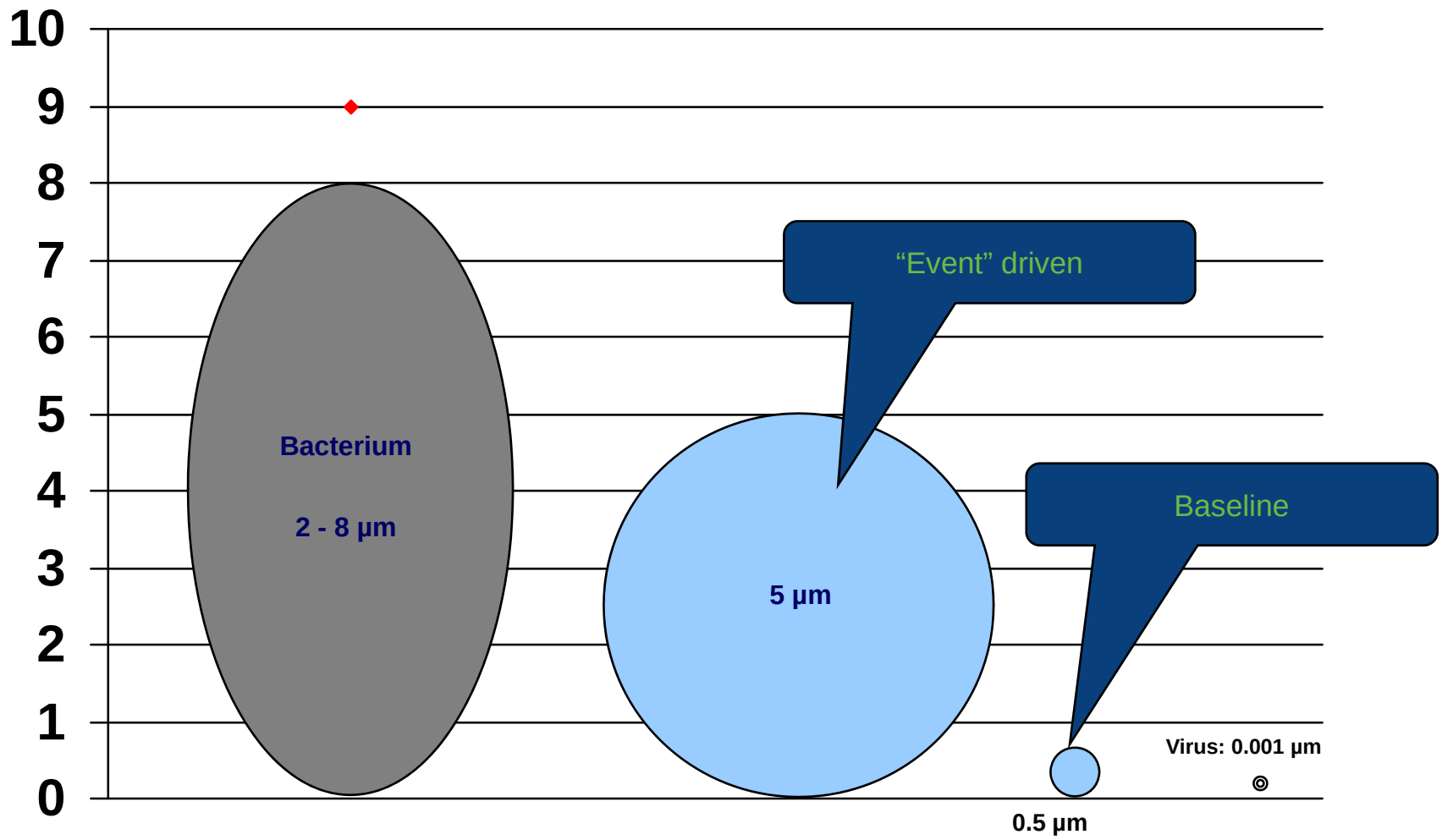
- Determine readiness of room to carry out designated task
- Performed whenever relevant activity will occur – ***daily work***
- Most labor intensive

Typically performed with portable counters

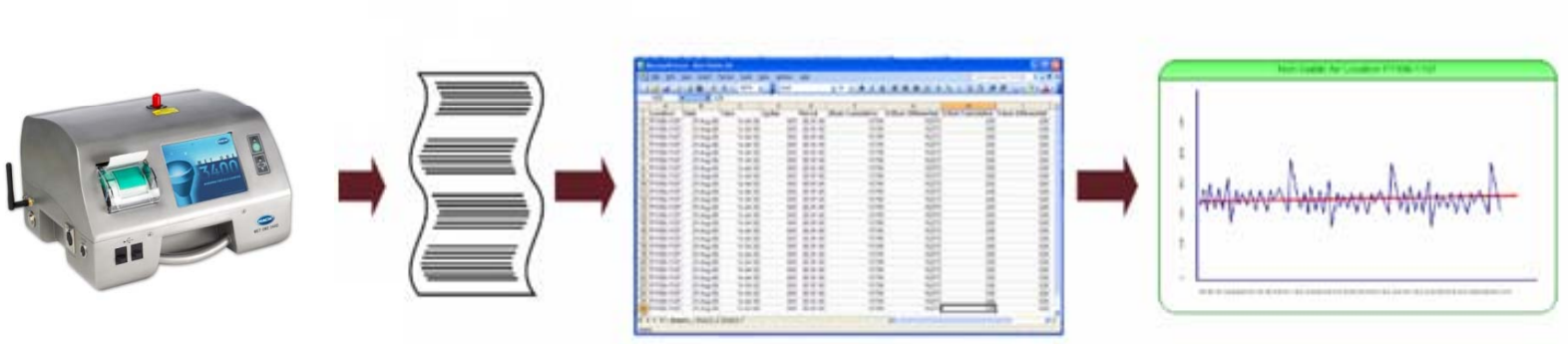
- Number of sample points defined by risk assessment
  - Activity to be performed
  - Risk to product
- Frequency and volume of sample points defined by risk assessment
  - Frequent enough to show control
  - Frequent enough to manage risk of product contamination

Inferred guidance, not rigid by regulation

Particle Monitoring



Manual Monitoring: A Paper Based Process



- Technicians manually record the time, placement and calibration check of devices on paper
- Data is transcribed and reconciled manually from paper printouts to log books and spreadsheets
- Analysts spend days or weeks formatting data in spreadsheets to provide basic analysis and trends, especially when data needs correlation with viable monitoring activity

Key Issues with Current EM Methodologies

- The majority of non-viable particle monitoring performed is a time-consuming manual process governed by company specific written SOPs
- This process:
  - Is paper-based and error-prone
  - Is labor intensive
  - Requires high level expertise to understand and follow protocols
  - Results in slow corrective actions (and few pre-emptive actions)

There is a better way … MET ONE CWS

MET ONE Compliance Workflow System

MET ONE CWS Consists of:

MET ONE 3400 Portable Particle Counter

MET ONE CWS Software (Powered by MODA)

Laptop or tablet PC for online data collection

Server PC for Database

MET ONE CWS Software Offers

- Automated scheduling to drive workflow
- Paperless capture of portable particle count data (wired or wireless)
- Immediate notification of non-compliant events/trends
- Comprehensive trending, mapping and reporting tools
- Comprehensive data visualization tools
- Ability to export data to other systems (LIMS, SPC Tools)
- 21 CFR Part 11 compliant

Demonstration

MET ONE Compliance Workflow System

MET ONE CWS Software

- Automated scheduling to drive workflow
  - Frequency based for EM routines
  - On-demand
- Paperless capture of portable particle count data (wired or wireless)
  - Run MET ONE 3400 directly from PC tablet or laptop
  - Supports disconnected operation
  - No paper tape and associated manual data entry and validation
- Immediate notification of non-compliant events/trends
  - Automatic email notification when alert or action limits are exceeded
  - Configure for below-limit excursions or frequency-based events

MET ONE CWS Software

- Comprehensive trending, mapping and reporting tools
  - Quickly generate required reports
  - Trend charts and statistical summaries
  - Ad-hoc analysis for determining root cause
- Comprehensive data visualization tools
  - Particle count data overlaid on room diagrams
  - Workflow-driven ISO 14644 sampling: more than calculations
    - ISO sampling pattern overlaid on facility blueprint as SOP
    - Samples automatically controlled for Grade A/B/C/D areas
- Automatic compliance checking for equipment calibration
- Data export to other systems (LIMS, SPC Tools)
- Allows you to be 21 CFR Part 11 compliant
  - Including E-signatures, data security, audit trail

MET ONE Compliance Workflow System Requirements

- Minimum
  - Met One 3400 particle counters
  - One laptop or tablet PC for each counter
  - One server computer
  - Wired or wireless Ethernet network
- Optional
  - Bar code reader for each tablet PC

All MET ONE 3400 Particle Counters are designed to comply with ISO 21501

MET ONE CWS: Products and Services

- MET CWS software license
  - Support for up to six MET ONE 3400 counters

  or

  - Support for more than six MET ONE 3400 counters

  AND

  - 1st year software support agreement
- Optional accessories
  - Bar code readers
- Optional MET ONE services
  - Validation documentation package
  - Pre-installation consultation services
  - On-site installation, commissioning and training
  - On-site validation assistance
  - Data integration with in-house LIMS system
    - Real-time updates or historical data

Upgrade Path to MODA-EM

- Provides all MET ONE CWS features
- Automated, paperless monitoring
  - Viables testing
  - Utilities (water, compressed gases)
  - Product testing
- Additional reports for full QC Micro coverage
    - Trend particulate count data versus other EM and Utility monitoring results
    - Organism reports, personnel monitoring reports
    - Visualization of entire spectrum of QC Micro tests on facility maps
  - Additional device integration available
- Upgrade accomplished via configuration updates
  - No need for new software installation
  - Minimizes validation impact

Like what you see?

- Choose the MET ONE CWS Package:
  - Automation of the non-viable particle count data collection only
  - Lower cost to implement and validate
  - Incremental “low-risk” approach to proving benefits of full EM automation
  - Available from Hach Company

With an upgrade path …

- Choose the full MODA-EM Package:
  - Automation of the entire environmental monitoring program
  - All elements of QC Microbiology (viable, non-viable, utilities, etc)
  - Available from MODA Technology Partners

Summary

- MET ONE Compliance Workflow System
  - Automated scheduling to drive workflow
  - Paperless capture of portable particle count data (wired or wireless)
  - Immediate notification of non-compliant events/trends
  - Comprehensive trending, mapping and reporting tools
  - Comprehensive data visualization tools
  - Data export to other systems (LIMS, SPC Tools)
  - Complete support services
- Now available for all existing and future MET ONE 3400 series air particle counters from Hach Company

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Questions & Answers

➔**To submit a question, use the "Q&A"** feature of WebEx (bottom right of your screen). If we do not answer a question online, we will be sure to follow up with an e-mail.

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