MERCURY

Workplace Air Sampling and Chemical Exposure Assessment

13 – 17 September 2027
London (UK)



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Workplace Air Sampling and Chemical Exposure Assessment

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Workplace Air Sampling and Chemical Exposure Assessment is a 1-week course for health and safety staff who must measure what workers breathe and decide whether it is acceptable. You plan sampling, choose pumps, media and direct-reading instruments, calculate time-weighted averages, compare results with occupational exposure limits and write up findings, leaving with an Air Sampling Plan and Exposure Report Template for your site. Mercury Training Center delivers this workplace air sampling course.

About This Course

Many sites hold a cupboard of monitoring results that nobody can interpret, or take one grab sample and call a process safe. This course teaches you to plan sampling that answers a real question. You should already carry out risk assessments or site inspections. You practice on sampling worksheets, laboratory reports and exposure data sets.

Who It Is For

- Staff who assess health risks from dusts, fumes, vapors and gases at work.
- Staff who collect air samples or use gas detectors on site.
- Supervisors responsible for work areas where solvents, metals or silica are handled.
- Staff who review contractor or laboratory monitoring reports.
- Staff who select and check ventilation and respiratory protection.

This course is not for readers who need noise, heat, vibration or biological hazards covered in depth, who are better served by a broader multi-hazard exposure assessment course, nor for laboratory chemists running sample analysis, who need a course on analytical methods.

Competencies You Will Build

- Similar Exposure Grouping: you group workers by task and agent before deciding who to sample.
- Sampling Strategy Design: you set the number, duration and timing of samples for a clear decision.
- Sampling Equipment Use: you calibrate pumps, select media and record field data correctly.
- Exposure Calculation: you compute time-weighted averages and short-term values from field records.
- Limit Comparison Judgment: you compare results with exposure limits and state an acceptable, uncertain or unacceptable verdict.
- Control Recommendation: you link results to engineering, administrative and PPE controls.

What You Will Be Able to Do

By the end of the course you will be able to:

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- Given a process description and safety data sheets, list the airborne agents, routes of entry and tasks most likely to cause exposure.
- Using a task list, define similar exposure groups and select workers for personal sampling.
- From pump flow and sample duration records, calculate air volumes and time-weighted average concentrations.
- Given a set of results, assess variability and decide whether exposure is acceptable against the limit.
- Using direct-reading instrument data, identify peak tasks and set short-term checks.
- From the findings, draft an exposure report with ranked risks and control actions.

Course Content

Day 1: Airborne Hazards and Exposure Basics

- Dusts, Fumes, Mists, Vapors And Gases In Industrial Processes
- Routes Of Entry And Health Effects Of Common Chemical Agents
- Safety Data Sheets And Process Walk-Through For Hazard Identification
- Occupational Exposure Limits, ACGIH TLVs And Short-Term Limits
- Screening Noise, Heat And Radiation Alongside Chemical Surveys

Day 2: Sampling Strategy

- AIHA Exposure Assessment Strategy For Basic Characterization
- Similar Exposure Groups And Worker Selection
- Personal Versus Area Sampling Decisions
- Sample Number, Duration And Timing Across Shifts
- Sampling Plan Worksheets And Chain Of Custody

Day 3: Equipment and Field Practice

- Sampling Pumps, Flow Calibration And Pre-Post Checks
- Filters, Sorbent Tubes And Passive Badges By Agent Type
- Respirable And Inhalable Dust Samplers For Silica And Metals
- Direct-Reading Gas Detectors And Photoionization Instruments
- Field Notes, Blanks And Sample Shipping To The Laboratory

Day 4: Calculating and Interpreting Results

- Time-Weighted Average And Short-Term Calculations
- Mixtures And Additive Effect Calculations
- Exposure Variability And Statistical Tools For Small Data Sets
- Ranking Exposure Severity And Prioritizing Risks
- Hierarchy Of Controls, Local Exhaust Ventilation And Respirator Selection

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Day 5: Sampling and Reporting Practice

- Exercise: Sampling Plan For A Welding And Grinding Area
- Exercise: Interpreting Solvent Vapor Results From A Paint Shop
- Exercise: Peak Exposure Review From Gas Detector Logs
- Exposure Report Structure, Records And Reassessment Triggers
- Air Sampling Plan and Exposure Report Template Completion And Peer Review

Case Studies and Exercises

The following are suggested activities used during the course:

- Case study: a construction site cuts concrete indoors and workers report dust; you decide the sampling approach and interim controls.
- Case study: a pharmaceutical plant changes a cleaning solvent; you judge whether earlier monitoring still applies.
- Exercise: for a refinery maintenance crew, you group tasks and set personal sampling for benzene-containing streams.
- Exercise: for a hospital sterilization unit, you review gas detector readings and recommend ventilation checks.

What You Take Back

You return with an Air Sampling Plan and Exposure Report Template built around a real task at your workplace. In your first month back, use it to brief the team, run the first round of sampling and report results with clear control actions.

- A hazard and similar exposure group register.
- A sampling plan with methods, media and durations.
- A calculation sheet for time-weighted averages and limit comparison.
- A report template with ranked risks and controls.

Quick Answers FAQ

What should I know before a workplace air sampling course?

You should already carry out risk assessments or inspections and understand basic chemical hazards. Simple arithmetic for flow rates and averages is enough. No prior sampling experience is needed; each step is practiced with worksheets and data sets.

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How does a workplace air sampling course differ from a multi-hazard exposure assessment course?

A multi-hazard course spans chemical, physical, biological, ergonomic and psychosocial agents. This one-week course concentrates on airborne chemicals: planning samples, using equipment, calculating exposures and comparing them with limits.

How many air samples are needed to judge chemical exposure?

One sample rarely settles the question. Exposure assessment strategies use several samples per similar exposure group, so that variability can be estimated and the result compared with the limit with reasonable confidence.

What do I take back from chemical exposure assessment training?

You take back an Air Sampling Plan and Exposure Report Template: a hazard and exposure group register, a sampling plan, a calculation sheet and a report format for ranking risks and recommending controls.

For Your Manager

After this course, the team member will be able to plan and carry out air sampling, calculate time-weighted averages, judge results against exposure limits and recommend controls. They return with an Air Sampling Plan and Exposure Report Template, first used to run sampling on a high-concern task and report the findings to management.