

New Standards – How they Affect Testing Protocols in Laboratory Testing

2013



The order of the Law

There is a legal pecking order that dictates what Codes and Standards should be use for worker protection.

#1 LAWS

- A OSHA FEDERAL
- B OSHA STATE
- C EPA FEDERAL
- D EPA STATE
- E NRC FEDERAL
- F ADA FEDERAL



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Continued

#2 CODES

A NFPA (FIRE)

B BUILDING (IBC, BOCA, UBC, ETC.)

C ASME, JIC, NEC, ETC.



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Continued

#3 ANSI NATIONAL CONFORMANCE STANDARDS

- A ANSI/ASHRAE 110 FUME HOOD PERFORMANCE
- B ANSI/ AIHA Z9.5
- C ANSI/ASHRAE III 1988 TESTING AND BALANCING
- D ANSI/ASHRAE 62 - SUPPLY AIR QUALITY
- E ACGIH- INDUSTRIAL VENTILATION HANDBOOK



The order of the Law

Continued

#4 STANDARDS, GUIDELINES, AND RECOMMENDED PRACTICES

- A. SEFA -1 (FUME HOOD TRADE ORGANIZATION)
- B. PRUDENT PRACTICES IN LABORATORIES



OVERVIEW

Many regulatory changes have been brought into the laboratory environment

The basis for the OSHA 29 CFR Part 1910 is to encourage joint labor management efforts to reduce injuries and diseases arising out of employment in laboratory environment as well as developing innovative methods, techniques, and approaches for dealing with occupational safety and health problems.



What types of hazardous chemicals are present in laboratories?

Hazardous chemicals present physical or health threats to workers in clinical, industrial, and academic laboratories.

They include carcinogens, toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins as well as agents that act on the hematopoietic systems or damage the lungs, skin, eyes, or mucous membranes.

OSHA currently has rules that limit exposures to approximately 400 substances.



The New Standard

The new OSHA standard differs from many OSHA health standards in that it **does not establish new exposure limits** but **sets other performance provisions** designed to protect laboratory workers from potential hazards in their work environment.



OSHA Standard

Permits a greater degree of flexibility in laboratories for developing and implementing employee safety and health programs.



Expected Benefits

- Increased worker awareness of potential risks
- Improved work practices
 - Existing PPE
 - Engineering controls
 - fume hoods
 - vacuum systems
 - glove boxes

which limit chemical exposure and are considered conventional technology that can be found in nearly all laboratories.



“Laboratory use”?

Performing chemical procedures using small quantities of hazardous chemicals on a laboratory scale and not as part of a production process in an environment where protective laboratory practices and equipment are in common use.



ANSI Z9.5 – 2012

Function of a Laboratory?

Laboratories conduct teaching, research, quality control, and related activities and should satisfy several general objectives, in addition to being suited for the intended use they should be:



ANSI Z9.5 – 2012

- Energy efficient without sacrificing safety, compliance, or space condition requirements
- Safe places to work, comply with environmental, health, and safety regulations, and
- Meet any necessary criteria for the occupants and technology involved in terms of control of temperature, humidity, and air quality.



Employers are required to have a chemical hygiene plan

If your laboratory employees use hazardous chemicals, you must develop and implement a written chemical hygiene plan to protect them. In addition to appropriate safety and health procedures and hygiene practices for hazardous chemicals in laboratories, **the plan must include the following:**



Chemical Hygiene Plan

- Criteria for reducing employee exposure to hazardous chemicals;
- Use of personal protective equipment;
- Requirements that ensure fume hoods and other protective equipment are functioning properly;
(ASHRAE – 110)
- Provisions for employee training;
- Circumstances requiring employer approval of certain laboratory operations, procedures, or activities before implementation;



Laboratory Ventilation Management Plan (LVMP)

Management shall establish a Laboratory Ventilation Management Plan (**LVMP**) to ensure proper selection, operation, use, and maintenance of laboratory ventilation equipment.



ANSI Z9.5 – 2012 LVMP

Ensure proper operation of the lab ventilation systems, help protect laboratory personnel working with potentially hazardous airborne materials, provide satisfactory environmental air quality and maintain efficient operation of the laboratory ventilation systems.



ANSI Z9.5 – 2012 LVMP

Provides the framework for keeping the systems operating to satisfy the primary functional requirements of building personnel.



How does this affect NEBB?

The US Congress has put some teeth into the regulations – providing for a monitoring process to ensure the health of the workers through continuous monitoring.

The employer is required to measure an employee's exposure to any substance regulated by a standard which requires monitoring if there is reason to believe that exposure levels for that substance routinely exceed the action level (or in the absence of an action level, the PEL).



How must employers monitor employee exposures?

Monitoring used to be terminated when employee exposures were below the action level but now the burden of proof lies with the employer that all devices have been properly tested and commissioned with periodic verification of performance.

Monitoring and healthcare can continue for an employee's entire life.



Exposure Control Devices

There are numerous exposure control devices including:

- Laboratory Fume Hoods
- Biological Safety Cabinets (BSC)
- Glove boxes
- Local exhaust hoods, and other ventilated enclosures



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OSHA

OSHA requires that, employers are responsible for ensuring that exposure control devices are functioning properly and implementing feasible control measures to reduce employee exposures if the exposures exceed the PELs.

The problem is:

OSHA does not promulgate specific control device testing protocols.



OSHA

But, if an employer discovers through their hazard assessment efforts or employee feedback, that exposure control devices are not effectively reducing employee exposures, it is the employer's responsibility to adjust controls or replace engineering controls as necessary.



Performance Evaluation

The performance of an exposure control device is ultimately determined by its ability to control exposure to within applicable standards or other safe limits.



Who evaluates the performance?

The LVMP should provide guidelines and specifications for implementation and proper operations of the complete laboratory environment.



Beginning of the LVMP

- **Commissioning** to verify proper performance prior to occupancy and use of the laboratory hoods
- **Training programs** for ensuring proper use, testing and maintenance of the laboratory hoods
- **Design** of laboratory ventilation systems
- **Maintenance** procedures for providing and documenting reliable operation



LVMP

- **Periodic confirmation** that the ventilation system is used properly
- **Proper selection** of appropriate laboratory hoods
- **Specification of monitors** to continuously verify proper operation of the laboratory hoods, and standard procedures for routine testing..



NEBB's Involvement

NEBB through its various disciplines can provide the expertise to the Laboratory Owners, Managers, Engineers, etc. for the development and required confirmation of a Laboratory Ventilation Management Plan (LVMP) to meet the continuously changing research environment.

Guidance by the knowledgeable Certified Professionals in the diverse yet integrated NEBB programs will provide a safer environment while enhancing the reputation and integrity of the organization.



Training

Enhancement of the training opportunities in all the disciplines to meet the requirements in the Laboratory environment.

Provide increased awareness to the biological and chemical dangers associated with the research industry.

Verify that all disciplines have a safety plan and follow it!



Meeting the Need!

Educating our clients

- What do they need for a viable LVMP
 - Development of the plan
- How to start
 - Implementation of the proper testing
- Follow through
 - Continuous monitoring



Consequences

Under the laboratory standard, routine exposure above an action level will require the same exposure monitoring and medical surveillance provisions as in the relevant substance specific standard.

In plain old English – there is a liability to monitor and provide necessary medical and financial assistance **until?**



What does it all mean?

The OSHA standard added the term hazardous chemical to further clarify the fact that the laboratory employer must offer protection to all laboratory workers in all situations.

It also defines employees not as not just laboratory workers but also personnel that through their course of employment are required to enter the lab where potential exposures may occur; such as maintenance, custodial, or contractors. Even personnel with advanced degrees; e.g., chemists and researchers may not possess the proper training in safety aspects associated with chemical exposures.



Monitoring or testing?

The changes in OSHA Laboratory Standard affects other regulations and standards; such as AIHA/ANSI Z9.5 - 2012 which in turn has adopted these changes as well as US Congress input.

Without proper determination of performance of exposure control devices and continued monitoring to ensure proper and adequate performance, all parties are exposing themselves to greater liability not just to an exposed worker but everyone in that environment.

The liability for health care monitoring is not assigned to just the owner/employer but can include all parties from manufacturer, installer, TAB contractor, etc.



NEBB's Involvement

While this is only one area of involvement for NEBB, the continued research and development as well as healthcare industries are growing rapidly requiring the expertise available from our Certified Professionals.

Besides providing a safer environment, we are able to promote the competency of our organization and provide a viable opportunity for the NEBB firms and CP's.



Questions or comments?

