

Design Guidelines-Laboratory Systems

GENERAL

The Florida State University (FSU) requires construction or renovation projects to meet all applicable code and regulatory compliance requirements. Incorporation of consensus standard recommendations and commonly recognized best practices is also expected. This information is intended to supplement those requirements and other items specifically listed in this “FSU Design Guidelines and Specifications” manual in order to assist with compliance and address issues that have arisen related to safety equipment and systems during past projects. It is not intended to be all inclusive but should provide sufficient scope to design professionals for most projects. The Environmental Health & Safety (EH&S) Department may always be consulted for amplification or clarification of this information, especially for large, complex or unique projects at (850) 644-6895.

The primary references containing legal compliance requirements specific to these types of applications are:

NFPA30, 2008 edition*, *Flammable and Combustible Liquids Code*

NFPA45, 2004 edition*, *Standard on Fire Protection for Laboratories Using Chemicals*

NFPA55, 2005 edition*, *Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks*

29CFR1910 current edition, *Occupational Safety and Health Standards*

Chapter 64E-5 F.A.C., *Control of Ionizing Radiation Hazards* (applicable for radiation producing machines or radioactive materials storage or use areas)

2012 Florida Accessibility Code for Building Construction

**These standards are adopted and required by the Florida Fire Prevention Code, Chapter 69A-60.005 F.A.C., the version listed in this code should be utilized.*

The specifications and guidance contained in the following publications represent the primary non-mandatory references that shall also be followed to the greatest practical extent:

ANSI/AIHA Z9.5-2003, *Laboratory Ventilation*

ANSI/ASHRAE 110-1995, *Method of Testing Performance of Laboratory Fume Hoods*

ANSI Z358.1-2009, *Emergency Eyewash and Shower Equipment*

ACGIH *Industrial Ventilation, A Manual of Recommended Practice for Design*, 26th Edition

29CFR1910.1450, App A, *National Research Council Recommendations Concerning Chemical Hygiene in Laboratories*

HHS Publication No. (CDC) 21-1112, rev 2009, *Biosafety in Microbiological and Biomedical Laboratories, 5th Edition* (applicable for potentially infectious organism storage or areas that require biological containment)

National Research Council, *Prudent Practices in the Laboratory, Updated Version*

The FSU EH&S specific requirements and interpretations listed below are intended to provide consistency across all University properties and must be followed to most effectively ensure the protection of personnel and the environment. Design professionals should not deviate from this

guidance without consulting with appropriate EH&S Industrial Safety and Health Engineers (University Biological, Chemical, Laboratory or Radiation Safety Officers or their supervisors).

PLANNING

Design professionals are encouraged to explore the latest technologies and approaches for optimizing performance and providing safe and reliable systems that also conserve energy. However, priority for selection should be given to system designs that have been proven by actual operation in similar environments. There is much room for improvement in our current laboratory settings without sacrificing safety by properly utilizing available technologies.

Experience demonstrates that the needs of our researchers are not always sufficiently delineated at the onset of new construction projects and future potential laboratory use is often unknown. This tends to drive designs in a direction that is too conservative from a safety standpoint, wasting resources and energy without any real benefit. Design teams have been persuaded during past projects to honor very specific requests by individual researchers that proved to be unnecessary and inconsistent with university standards or industry best practices, this lead to laboratories that were not suitable for either the intended research or use by future occupants. EH&S personnel will gladly consult with the research group(s) and the Utilities Department to assist design professionals with this analysis during the planning process.

- [Laboratory Ventilation](#)
 - Fume Hoods
 - Other Local Exhaust
 - Exhaust Fans and Stacks
- [Laboratory Plumbing](#)
 - Safety Showers and Eyewashes
 - Other Plumbing Considerations
- [Specific Laboratory Hazards](#)
 - Biological Hazards
 - Radiation Hazards
 - Flammable Liquids Storage and Quantities
 - Compressed Gases and Cryogenic Fluids
- [General Laboratory Considerations](#)
 - Laboratory Associated Personal and Office Spaces
 - Accessibility
 - Laboratory Furnishing and Flooring
 - Noise