



CAMPUS FIRE SAFETY CODE TALK

Campus Fire Safety e-NewZone

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Fire code requirements for laboratories at college and universities

When chatting with representatives from the college and university community it reminds me of another topic I often get questions about and that is regarding the application of NFPA 1 to laboratories on college campuses.

First, laboratories must be assigned a proper occupancy classification. In NFPA 1 there is no separate occupancy classification for a lab, rather they fall under one of the occupancy classifications as defined in Chapter 6 (and Chapter 3). From NFPA 101, Life Safety Code, we are given some guidance on how to classify a laboratory as follows, and this guidance may be carried over into the application of NFPA 1 as well:

Users may (mistakenly) assume that colleges and universities are classified as educational occupancies. However, based on the definition of educational occupancies, most, if not all buildings that are part of colleges and universities are classified as occupancies other than educational as they are instructing students beyond the 12 th grade. If one finds him/herself in the educational occupancy chapter in NFPA 101, they are redirected as follows:

Educational facilities that do not meet the definition of an educational occupancy (such as a building on a college or university campus) ...shall comply with the following requirements:

- (1) Instructional building – business occupancy
- (2) Classrooms under 50 persons – business occupancy



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- (3) Classrooms, 50 persons and over – assembly occupancy
- (4) Laboratories, instructional – business occupancy
- (5) Laboratories, noninstructional – industrial occupancy

Colleges and universities may have multiple types of laboratories on campus, those used for instructional purposes, where classes are held for example, and those would be classified as a business occupancy. This classification is based upon the presence of more people, a more classroom-like arrangement of lab stations used for instruction and learning, and usually less quantities of hazardous materials or chemicals. Noninstructional labs are classified as industrial occupancies for their characteristics of having a relatively low occupant load, the likely presence of more laboratory equipment and/or sophisticated, industrial-type equipment and likely contain hazardous materials and chemicals. Instructional labs may go by a variety of names on college such as makerspaces, innovation spaces or research labs. Regardless of what they are referred to, the use of the laboratory should be carefully considered so that it can be assigned the correct occupancy and then protected accordingly.

In addition to the occupancy-specific requirements, NFPA 1 also has a separate chapter for laboratories using chemicals. Chapter 26 requires the handling or storage of chemicals in laboratory buildings, laboratory units, and laboratory work areas whether located above or below grade to comply with the provisions in that chapter. The construction and protection of new laboratories shall also comply with NFPA 45, Standard on Fire Protection for Laboratories Using Chemicals.

The purpose of this standard is to provide basic requirements for the protection of life and property through prevention and control of fires and explosions involving the use of chemicals in laboratory-scale operations. Its requirements are designed to control hazards and protect personnel from the toxic, corrosive, or other harmful effects of chemicals to which personnel might be exposed as a result of fire or explosion and to



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achieve a comprehensive laboratory fire prevention and protection program to prevent injury or death to occupants and emergency response personnel. Due to the special nature of laboratories using chemicals, NFPA 45 modifies and supplements existing codes and standards so as to apply more specifically to buildings or portions of buildings devoted to laboratory-scale operations.

New in the 2015 edition of NFPA 45, which is referenced by NFPA 1 2018 edition, the scope was expanded to also apply to all educational laboratory units and instructional laboratory units where chemicals with health hazards, flammability hazards or instability hazards are being used (see NFPA 704 and NFPA 45 Section 1.1.2 for the specific application). Instructional laboratories are those under the direct supervision of an instructor that are used for the purposes of instruction for students beyond the twelfth grade, thus college instructional laboratories would require compliance with Chapter 26 (educational laboratories address those for use by below the twelfth grade and not applicable to a college/university setting.) Before Chapter 26 is applied it should be carefully reviewed for its application which is addressed in the 26.1 section of the Code.

Chapter 12 of NFPA 45 addresses those requirements specific to instructional laboratory operations. By reference to NFPA 45 through NFPA 1 Chapter 26, requirements for instructor responsibilities, chemical storage and handling, performance of experiments or demonstrations, fire rated construction and fire protection systems are applicable to instructional laboratories.

In addition to the reference to NFPA 45 for laboratories using chemicals, NFPA 1 requires fire prevention, maintenance and emergency plans to be established. Laboratory buildings, laboratory units, and laboratory work areas need to have clearly developed plans for fire prevention, maintenance, and emergency procedures. The guidance of the development of these plans and procedures can also be found in NFPA 45. Permits are required for construction, alteration or operation of laboratories per



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Section 26.3 and 1.12.

Do you work with colleges and universities with laboratories on campus? What issues have you faced with enforcing the fire code in these spaces?

NOTE: This article first appeared as a post on NFPA's blog, NFPA Today, in November 2018 as part of Ms. Bigda's "Fire Code Fridays" series, and has been edited.

Link to original blog:

<https://community.nfpa.org/community/nfpa-today/blog/2018/11/16/nfpa-1-fire-code-requirements-for-laboratories-at-college-and-universities-firecodefridays>



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